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Hydrology and Earth System Sciences
Discussions

Supplement of

A parsimonious analytical model for simulating multispecies plume migration

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Supplement 1. Development of a FORTRAN computer code for the derived analytical solutions in Eqs. (17), (18) and (19)

Note that Eqs. (17)-(19) involve a series of eigenvalues, ξ_l, which need to be determined from the equation

$$\xi_l \cot \xi_l - \frac{{\xi_l}^2}{Pe_L} + \frac{Pe_L}{4} = 0 \tag{S1}$$

To numerically evaluate these eigenvalues, a bisection method with a small increment of ξ_l is used to determine all the eigenvalues. After determining the eigenvalues, we can substitute the eigenvalues into Eqs. (17)-(19) to numerically evaluate the solution. The procedures for numerical evaluation of solution appear to be a straightforward task. Because the solutions in Eqs. (17), (18) and (19) consist of several tiers of summations, we need to use several looping algorithm to achieve the computation of several tiers of summation structure presented in Eqs. (17), (18) and (19).

Supplement 2. Development of a FORTRAN computer code for the LTFD solution.

To develop the LTFD solution, a finite difference method is employed by discretizing the X variable of Eqs (A8a) and (A8b). The advection terms are approximated using the upwind difference formulae. After substituting the difference formulae into the transformed partial differential equation, the algebraic equation and rearranging terms, the final form

of the finite difference equations take the following form:

$$A_1(H_1)_{j-1} + A_2(H_1)_j + A_3(H_1)_{j+1} = A_4 \tag{S2}$$

$$B_1(H_i)_{j-1} + B_2(H_i)_j + B_3(H_i)_{j+1} + B_4(H_{i-1})_j = B_5 \quad i = 2..., N \tag{S3}$$

where $A_1 = \dfrac{1}{Pe_L(\Delta X)^2} + \dfrac{1}{\Delta X}$, $A_2 = -\dfrac{2}{Pe_L(\Delta X)^2} - \dfrac{1}{\Delta X} - \left(R_1 s + \kappa_1 + \dfrac{\rho^2 n^2 \pi^2}{Pe_T} \right)$,

$A_3 = \dfrac{1}{Pe_L(\Delta X)^2}$, $A_4 = 0$, $B_1 = \dfrac{1}{Pe_L(\Delta X)^2} + \dfrac{1}{\Delta X}$,

$B_2 = -\dfrac{2}{Pe_L(\Delta X)^2} - \dfrac{1}{\Delta X} - \left(R_i s + \kappa_i + \dfrac{\rho^2 n^2 \pi^2}{Pe_T} \right)$, $B_3 = \dfrac{1}{Pe_L}\dfrac{1}{(\Delta X)^2}$, $B_5 = -\kappa_{i-1}$

and $B_6 = 0$.

To solve the coupled set of algebraic equations, several methods have been proposed. The most rigorous approach is to solve the all algebraic equations simultaneously, which is commonly referred to as the fully-coupled method. Alternatively, iteratively coupled techniques can be employed to obtain the solution. The fully coupled technique requires a global coefficient matrix that includes all the unknown degrees of freedom associated with the discretized problems of the system. However, for most two-dimensional coupled differential equation problems, the fully coupled solver is computationally expensive. In contrast, in the sequential iteration approach (SIA), each of the coupled nonlinear differential equation is solved individually in a sequential

manner, thus greatly reducing the size of the coefficient matrix. Accordingly, the implicit SIA algorithm is adopted in this study to solve the coupled set of algebraic equations. The set of algebraic equations, as represented by Eq. (S2) and (S3) can be solved using direct Gaussian elimination solvers to yield the solution at each node. In addition, a FORTRAN subroutine DLSACB can be used (see Visual Numerics Inc., 1994). The solutions in original domain at each node are the Laplace and finite Fourier cosine inversions of the solution at each node. Finite Fourier cosine inverse transform as in (A12) expressing as an infinite series can be straightforwardly evaluated. However, the Laplace inverse transform must be determined numerically. A FORTRAN subroutine DINLAP/INLAP (Visual Numerics Inc., 1994) based on the de Hoog et al. (1982) algorithm, is employed to perform the Laplace inversion.

References

Visual Numerics, Inc., 1994. IMSL User's Manual, Houston, TX.

Supplement 3. Detailed results of the convergence test examples 1 and 2

Table S1

Solution convergence at transect of inlet boundary ($x = 0$) for four-species radionuclide transport problem considering simulated domain of $L = 250$ m, $W = 100$ m, subject to Bateman-type sources located at $40\,m \le y \le 60\,m$ for t = 1,000 year (M = number of terms summed for inverse generalized integral transform; N = number of terms summed for inverse finite Fourier cosine transform).

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x [m]	y [m]	$M = 100$ $N = 16{,}000$	$M = 200$ $N = 16{,}000$	$M = 400$ $N = 16{,}000$	$M = 800$ $N = 16{,}000$	$M = 1{,}600$ $N = 16{,}000$
0	0	1.121E-10	5.596E-11	2.797E-11	1.402E-11	7.091E-12
0	2	1.126E-10	5.621E-11	2.810E-11	1.408E-11	7.123E-12
0	4	1.141E-10	5.695E-11	2.847E-11	1.427E-11	7.217E-12
0	6	1.166E-10	5.822E-11	2.910E-11	1.459E-11	7.378E-12
0	8	1.203E-10	6.007E-11	3.003E-11	1.505E-11	7.612E-12
0	10	1.253E-10	6.257E-11	3.128E-11	1.568E-11	7.929E-12
0	12	1.318E-10	6.583E-11	3.291E-11	1.649E-11	8.342E-12
0	14	1.402E-10	7.001E-11	3.500E-11	1.755E-11	8.884E-12
0	16	1.510E-10	7.550E-11	3.785E-11	1.908E-11	9.763E-12
0	18	1.670E-10	8.480E-11	4.380E-11	2.335E-11	1.320E-11
0	20	2.108E-10	1.200E-10	7.474E-11	5.217E-11	4.095E-11
0	22	4.616E-10	3.598E-10	3.089E-10	2.836E-10	2.710E-10
0	24	2.127E-09	2.011E-09	1.953E-09	1.924E-09	1.909E-09
0	26	1.197E-08	1.183E-08	1.176E-08	1.173E-08	1.171E-08
0	28	6.137E-08	6.120E-08	6.112E-08	6.108E-08	6.106E-08
0	30	2.714E-07	2.712E-07	2.711E-07	2.710E-07	2.710E-07
0	32	1.033E-06	1.032E-06	1.032E-06	1.032E-06	1.032E-06
0	34	3.412E-06	3.412E-06	3.411E-06	3.411E-06	3.411E-06
0	36	9.971E-06	9.971E-06	9.970E-06	9.970E-06	9.970E-06
0	38	2.677E-05	2.677E-05	2.677E-05	2.677E-05	2.677E-05
0	40	8.214E-05	8.214E-05	8.215E-05	8.215E-05	8.215E-05
0	42	1.375E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04
0	44	1.543E-04	1.543E-04	1.543E-04	1.543E-04	1.543E-04
0	46	1.608E-04	1.609E-04	1.609E-04	1.609E-04	1.609E-04
0	48	1.632E-04	1.632E-04	1.632E-04	1.632E-04	1.632E-04
0	50	1.637E-04	1.637E-04	1.637E-04	1.637E-04	1.637E-04

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x [m]	y [m]	M =1,600 N =1,000	M =1,600 N =2,000	M =1,600 N =4,000	M =1,600 N =8,000	M =1,600 N =16,000
0	0	3.612E-10	1.003E-10	3.451E-11	1.483E-11	7.091E-12
0	2	3.627E-10	1.008E-10	3.466E-11	1.490E-11	7.123E-12
0	4	3.675E-10	1.021E-10	3.512E-11	1.510E-11	7.217E-12
0	6	3.757E-10	1.044E-10	3.590E-11	1.543E-11	7.378E-12
0	8	3.877E-10	1.077E-10	3.704E-11	1.592E-11	7.612E-12
0	10	4.038E-10	1.122E-10	3.858E-11	1.658E-11	7.929E-12
0	12	4.248E-10	1.180E-10	4.059E-11	1.745E-11	8.342E-12
0	14	4.517E-10	1.255E-10	4.317E-11	1.857E-11	8.884E-12
0	16	4.860E-10	1.352E-10	4.664E-11	2.018E-11	9.763E-12
0	18	5.319E-10	1.498E-10	5.337E-11	2.454E-11	1.320E-11
0	20	6.138E-10	1.918E-10	8.532E-11	5.348E-11	4.095E-11
0	22	9.139E-10	4.403E-10	3.208E-10	2.851E-10	2.710E-10
0	24	2.644E-09	2.103E-09	1.966E-09	1.925E-09	1.909E-09
0	26	1.257E-08	1.194E-08	1.178E-08	1.173E-08	1.171E-08
0	28	6.209E-08	6.133E-08	6.114E-08	6.108E-08	6.106E-08
0	30	2.723E-07	2.714E-07	2.711E-07	2.710E-07	2.710E-07
0	32	1.034E-06	1.032E-06	1.032E-06	1.032E-06	1.032E-06
0	34	3.414E-06	3.412E-06	3.411E-06	3.411E-06	3.411E-06
0	36	9.974E-06	9.971E-06	9.970E-06	9.970E-06	9.970E-06
0	38	2.677E-05	2.677E-05	2.677E-05	2.677E-05	2.677E-05
0	40	8.214E-05	8.215E-05	8.215E-05	8.215E-05	8.215E-05
0	42	1.375E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04
0	44	1.543E-04	1.543E-04	1.543E-04	1.543E-04	1.543E-04
0	46	1.609E-04	1.609E-04	1.609E-04	1.609E-04	1.609E-04
0	48	1.632E-04	1.632E-04	1.632E-04	1.632E-04	1.632E-04
0	50	1.637E-04	1.637E-04	1.637E-04	1.637E-04	1.637E-04

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x [m]	y [m]	$M=100$ $N=1{,}000$	$M=200$ $N=2{,}000$	$M=400$ $N=4{,}000$	$M=800$ $N=8{,}000$	$M=1{,}600$ $N=16{,}000$	$M=3{,}200$ $N=32{,}000$
0	0	1.820E-09	4.545E-10	1.135E-10	2.837E-11	7.091E-12	1.773E-12
0	2	1.828E-09	4.565E-10	1.140E-10	2.850E-11	7.123E-12	1.780E-12
0	4	1.852E-09	4.625E-10	1.155E-10	2.887E-11	7.217E-12	1.804E-12
0	6	1.893E-09	4.728E-10	1.181E-10	2.952E-11	7.378E-12	1.844E-12
0	8	1.953E-09	4.878E-10	1.219E-10	3.045E-11	7.612E-12	1.903E-12
0	10	2.034E-09	5.081E-10	1.269E-10	3.172E-11	7.929E-12	1.982E-12
0	12	2.140E-09	5.346E-10	1.335E-10	3.337E-11	8.342E-12	2.086E-12
0	14	2.276E-09	5.684E-10	1.420E-10	3.550E-11	8.884E-12	2.232E-12
0	16	2.448E-09	6.116E-10	1.529E-10	3.839E-11	9.763E-12	2.608E-12
0	18	2.669E-09	6.686E-10	1.691E-10	4.438E-11	1.320E-11	5.409E-12
0	20	2.974E-09	7.648E-10	2.132E-10	7.539E-11	4.095E-11	3.235E-11
0	22	3.562E-09	1.083E-09	4.643E-10	3.097E-10	2.710E-10	2.614E-10
0	24	5.670E-09	2.838E-09	2.130E-09	1.953E-09	1.909E-09	1.898E-09
0	26	1.611E-08	1.280E-08	1.197E-08	1.176E-08	1.171E-08	1.170E-08
0	28	6.634E-08	6.236E-08	6.137E-08	6.112E-08	6.106E-08	6.104E-08
0	30	2.776E-07	2.726E-07	2.714E-07	2.711E-07	2.710E-07	2.710E-07
0	32	1.041E-06	1.034E-06	1.033E-06	1.032E-06	1.032E-06	1.032E-06
0	34	3.423E-06	3.414E-06	3.412E-06	3.411E-06	3.411E-06	3.411E-06
0	36	9.989E-06	9.975E-06	9.971E-06	9.970E-06	9.970E-06	9.970E-06
0	38	2.681E-05	2.678E-05	2.677E-05	2.677E-05	2.677E-05	2.677E-05
0	40	8.213E-05	8.214E-05	8.215E-05	8.215E-05	8.215E-05	8.215E-05
0	42	1.375E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04
0	44	1.543E-04	1.543E-04	1.543E-04	1.543E-04	1.543E-04	1.543E-04
0	46	1.608E-04	1.609E-04	1.609E-04	1.609E-04	1.609E-04	1.609E-04
0	48	1.632E-04	1.632E-04	1.632E-04	1.632E-04	1.632E-04	1.632E-04
0	50	1.637E-04	1.637E-04	1.637E-04	1.637E-04	1.637E-04	1.637E-04

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x [m]	y [m]	$M=25$ N =8,000	$M=50$ N =8,000	$M=100$ N =8,000	$M=200$ N =8,000	$M=400$ N =8,000
0	0	2.406E-06	1.210E-06	3.022E-07	1.509E-07	7.543E-08
0	2	2.416E-06	1.215E-06	3.035E-07	1.516E-07	7.576E-08
0	4	2.448E-06	1.231E-06	3.076E-07	1.536E-07	7.677E-08
0	6	2.503E-06	1.259E-06	3.144E-07	1.570E-07	7.848E-08
0	8	2.582E-06	1.299E-06	3.244E-07	1.620E-07	8.097E-08
0	10	2.690E-06	1.353E-06	3.379E-07	1.687E-07	8.434E-08
0	12	2.830E-06	1.423E-06	3.555E-07	1.775E-07	8.873E-08
0	14	3.009E-06	1.513E-06	3.780E-07	1.887E-07	9.434E-08
0	16	3.236E-06	1.628E-06	4.065E-07	2.030E-07	1.015E-07
0	18	3.525E-06	1.773E-06	4.429E-07	2.212E-07	1.106E-07
0	20	3.894E-06	1.960E-06	4.909E-07	2.461E-07	1.240E-07
0	22	4.397E-06	2.227E-06	5.784E-07	3.037E-07	1.667E-07
0	24	5.362E-06	2.881E-06	9.973E-07	6.833E-07	5.267E-07
0	26	9.568E-06	6.672E-06	4.471E-06	4.104E-06	3.921E-06
0	28	3.752E-05	3.407E-05	3.143E-05	3.099E-05	3.077E-05
0	30	2.106E-04	2.066E-04	2.033E-04	2.028E-04	2.025E-04
0	32	1.098E-03	1.095E-03	1.091E-03	1.090E-03	1.090E-03
0	34	4.816E-03	4.833E-03	4.827E-03	4.826E-03	4.826E-03
0	36	1.768E-02	1.788E-02	1.787E-02	1.787E-02	1.787E-02
0	38	5.537E-02	5.747E-02	5.753E-02	5.753E-02	5.753E-02
0	40	2.003E-01	2.024E-01	2.026E-01	2.027E-01	2.027E-01
0	42	3.452E-01	3.473E-01	3.477E-01	3.478E-01	3.478E-01
0	44	3.829E-01	3.869E-01	3.874E-01	3.874E-01	3.875E-01
0	46	3.957E-01	3.999E-01	4.004E-01	4.005E-01	4.005E-01
0	48	3.994E-01	4.036E-01	4.041E-01	4.042E-01	4.042E-01
0	50	4.001E-01	4.043E-01	4.049E-01	4.049E-01	4.049E-01

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x [m]	y [m]	$M=400$ $N=500$	$M=400$ $N=1{,}000$	$M=400$ $N=2{,}000$	$M=400$ $N=4{,}000$	$M=400$ $N=8{,}000$
0	0	4.301E-06	1.486E-06	6.400E-07	3.062E-07	1.513E-07
0	2	4.320E-06	1.493E-06	6.428E-07	3.075E-07	1.520E-07
0	4	4.377E-06	1.512E-06	6.513E-07	3.116E-07	1.540E-07
0	6	4.475E-06	1.546E-06	6.658E-07	3.185E-07	1.574E-07
0	8	4.617E-06	1.595E-06	6.870E-07	3.286E-07	1.624E-07
0	10	4.809E-06	1.662E-06	7.155E-07	3.423E-07	1.692E-07
0	12	5.059E-06	1.748E-06	7.528E-07	3.601E-07	1.780E-07
0	14	5.379E-06	1.859E-06	8.004E-07	3.829E-07	1.892E-07
0	16	5.786E-06	1.999E-06	8.609E-07	4.118E-07	2.035E-07
0	18	6.301E-06	2.177E-06	9.377E-07	4.486E-07	2.218E-07
0	20	6.961E-06	2.407E-06	1.037E-06	4.973E-07	2.468E-07
0	22	7.839E-06	2.728E-06	1.192E-06	5.856E-07	3.044E-07
0	24	9.295E-06	3.454E-06	1.698E-06	1.005E-06	6.842E-07
0	26	1.416E-05	7.341E-06	5.290E-06	4.481E-06	4.105E-06
0	28	4.306E-05	3.487E-05	3.241E-05	3.144E-05	3.099E-05
0	30	2.178E-04	2.076E-04	2.045E-04	2.033E-04	2.028E-04
0	32	1.110E-03	1.097E-03	1.093E-03	1.091E-03	1.090E-03
0	34	4.854E-03	4.835E-03	4.829E-03	4.827E-03	4.826E-03
0	36	1.792E-02	1.789E-02	1.788E-02	1.787E-02	1.787E-02
0	38	5.762E-02	5.756E-02	5.754E-02	5.753E-02	5.753E-02
0	40	2.027E-01	2.027E-01	2.027E-01	2.027E-01	2.027E-01
0	42	3.477E-01	3.478E-01	3.478E-01	3.478E-01	3.478E-01
0	44	3.874E-01	3.874E-01	3.874E-01	3.875E-01	3.875E-01
0	46	4.005E-01	4.005E-01	4.005E-01	4.005E-01	4.005E-01
0	48	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01
0	50	4.049E-01	4.049E-01	4.049E-01	4.049E-01	4.049E-01

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x [m]	y [m]	$M=25$ $N=500$	$M=50$ $N=1{,}000$	$M=100$ $N=2{,}000$	$M=200$ $N=4{,}000$	$M=400$ $N=8{,}000$	$M=800$ $N=16{,}000$
0	0	3.861E-05	9.714E-06	2.427E-06	6.058E-07	1.513E-07	3.781E-08
0	2	3.878E-05	9.756E-06	2.437E-06	6.085E-07	1.520E-07	3.797E-08
0	4	3.929E-05	9.885E-06	2.469E-06	6.165E-07	1.540E-07	3.848E-08
0	6	4.017E-05	1.011E-05	2.525E-06	6.303E-07	1.574E-07	3.933E-08
0	8	4.144E-05	1.043E-05	2.605E-06	6.503E-07	1.624E-07	4.058E-08
0	10	4.316E-05	1.086E-05	2.713E-06	6.773E-07	1.692E-07	4.227E-08
0	12	4.541E-05	1.143E-05	2.854E-06	7.126E-07	1.780E-07	4.447E-08
0	14	4.828E-05	1.215E-05	3.035E-06	7.577E-07	1.892E-07	4.729E-08
0	16	5.193E-05	1.307E-05	3.264E-06	8.149E-07	2.035E-07	5.086E-08
0	18	5.656E-05	1.423E-05	3.555E-06	8.876E-07	2.218E-07	5.549E-08
0	20	6.247E-05	1.572E-05	3.928E-06	9.822E-07	2.468E-07	6.312E-08
0	22	7.012E-05	1.767E-05	4.435E-06	1.130E-06	3.044E-07	9.837E-08
0	24	8.048E-05	2.053E-05	5.405E-06	1.627E-06	6.842E-07	4.487E-07
0	26	9.732E-05	2.729E-05	9.621E-06	5.207E-06	4.105E-06	3.830E-06
0	28	1.429E-04	5.882E-05	3.761E-05	3.231E-05	3.099E-05	3.066E-05
0	30	3.416E-04	2.374E-04	2.110E-04	2.044E-04	2.028E-04	2.024E-04
0	32	1.269E-03	1.135E-03	1.101E-03	1.092E-03	1.090E-03	1.090E-03
0	34	5.056E-03	4.889E-03	4.841E-03	4.829E-03	4.826E-03	4.825E-03
0	36	1.806E-02	1.797E-02	1.790E-02	1.788E-02	1.787E-02	1.787E-02
0	38	5.619E-02	5.766E-02	5.758E-02	5.754E-02	5.753E-02	5.753E-02
0	40	2.002E-01	2.024E-01	2.026E-01	2.027E-01	2.027E-01	2.027E-01
0	42	3.442E-01	3.471E-01	3.477E-01	3.478E-01	3.478E-01	3.478E-01
0	44	3.823E-01	3.867E-01	3.874E-01	3.874E-01	3.875E-01	3.875E-01
0	46	3.953E-01	3.998E-01	4.004E-01	4.005E-01	4.005E-01	4.005E-01
0	48	3.991E-01	4.035E-01	4.041E-01	4.042E-01	4.042E-01	4.042E-01
0	50	3.998E-01	4.043E-01	4.048E-01	4.049E-01	4.049E-01	4.049E-01

^{230}Th

x [m]	y [m]	$M=100$ $N=16{,}000$	$M=200$ $N=16{,}000$	$M=400$ $N=16{,}000$	$M=800$ $N=16{,}000$	$M=16{,}00$ $N=16{,}000$
0	0	1.097E-09	5.477E-10	2.738E-10	1.372E-10	6.940E-11
0	2	1.102E-09	5.501E-10	2.750E-10	1.378E-10	6.970E-11
0	4	1.116E-09	5.574E-10	2.786E-10	1.396E-10	7.063E-11
0	6	1.141E-09	5.698E-10	2.848E-10	1.428E-10	7.220E-11
0	8	1.177E-09	5.879E-10	2.939E-10	1.473E-10	7.449E-11
0	10	1.226E-09	6.123E-10	3.061E-10	1.534E-10	7.759E-11
0	12	1.290E-09	6.442E-10	3.220E-10	1.614E-10	8.163E-11
0	14	1.372E-09	6.850E-10	3.424E-10	1.716E-10	8.680E-11
0	16	1.475E-09	7.367E-10	3.683E-10	1.846E-10	9.335E-11
0	18	1.607E-09	8.024E-10	4.011E-10	2.010E-10	1.017E-10
0	20	1.775E-09	8.863E-10	4.431E-10	2.222E-10	1.124E-10
0	22	1.994E-09	9.969E-10	4.996E-10	2.517E-10	1.286E-10
0	24	2.313E-09	1.174E-09	6.056E-10	3.222E-10	1.815E-10
0	26	3.113E-09	1.782E-09	1.118E-09	7.866E-10	6.222E-10
0	28	7.724E-09	6.125E-09	5.328E-09	4.931E-09	4.734E-09
0	30	4.137E-08	3.938E-08	3.839E-08	3.789E-08	3.765E-08
0	32	2.620E-07	2.594E-07	2.581E-07	2.575E-07	2.572E-07
0	34	1.498E-06	1.495E-06	1.493E-06	1.492E-06	1.492E-06
0	36	7.769E-06	7.763E-06	7.760E-06	7.759E-06	7.758E-06
0	38	4.269E-05	4.267E-05	4.267E-05	4.266E-05	4.266E-05
0	40	3.637E-04	3.637E-04	3.637E-04	3.637E-04	3.637E-04
0	42	6.847E-04	6.848E-04	6.848E-04	6.848E-04	6.848E-04
0	44	7.196E-04	7.197E-04	7.197E-04	7.197E-04	7.197E-04
0	46	7.259E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04
0	48	7.271E-04	7.272E-04	7.272E-04	7.272E-04	7.272E-04
0	50	7.273E-04	7.274E-04	7.274E-04	7.274E-04	7.274E-04

^{230}Th

x [m]	y [m]	M =1,600 N =1,000	M =1,600 N =2,000	M =1,600 N =4,000	M =1,600 N =8,000	M =1,600 N =16,000
0	0	3.534E-09	9.818E-10	3.377E-10	1.452E-10	6.940E-11
0	2	3.550E-09	9.861E-10	3.392E-10	1.458E-10	6.970E-11
0	4	3.597E-09	9.991E-10	3.437E-10	1.477E-10	7.063E-11
0	6	3.677E-09	1.021E-09	3.514E-10	1.510E-10	7.220E-11
0	8	3.794E-09	1.054E-09	3.625E-10	1.558E-10	7.449E-11
0	10	3.952E-09	1.098E-09	3.776E-10	1.623E-10	7.759E-11
0	12	4.157E-09	1.155E-09	3.972E-10	1.707E-10	8.163E-11
0	14	4.420E-09	1.228E-09	4.224E-10	1.815E-10	8.680E-11
0	16	4.754E-09	1.321E-09	4.543E-10	1.953E-10	9.335E-11
0	18	5.178E-09	1.438E-09	4.948E-10	2.127E-10	1.017E-10
0	20	5.719E-09	1.589E-09	5.466E-10	2.350E-10	1.124E-10
0	22	6.419E-09	1.785E-09	6.157E-10	2.661E-10	1.286E-10
0	24	7.371E-09	2.075E-09	7.383E-10	3.387E-10	1.815E-10
0	26	9.022E-09	2.834E-09	1.273E-09	8.059E-10	6.222E-10
0	28	1.482E-08	7.389E-09	5.514E-09	4.954E-09	4.734E-09
0	30	5.018E-08	4.095E-08	3.862E-08	3.792E-08	3.765E-08
0	32	2.735E-07	2.615E-07	2.584E-07	2.575E-07	2.572E-07
0	34	1.515E-06	1.498E-06	1.493E-06	1.492E-06	1.492E-06
0	36	7.794E-06	7.768E-06	7.761E-06	7.759E-06	7.758E-06
0	38	4.274E-05	4.268E-05	4.267E-05	4.267E-05	4.266E-05
0	40	3.637E-04	3.637E-04	3.637E-04	3.637E-04	3.637E-04
0	42	6.847E-04	6.848E-04	6.848E-04	6.848E-04	6.848E-04
0	44	7.197E-04	7.197E-04	7.197E-04	7.197E-04	7.197E-04
0	46	7.259E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04
0	48	7.272E-04	7.272E-04	7.272E-04	7.272E-04	7.272E-04
0	50	7.274E-04	7.274E-04	7.274E-04	7.274E-04	7.274E-04

^{230}Th

x [m]	y [m]	$M=100$ $N=1{,}000$	$M=200$ $N=2{,}000$	$M=400$ $N=4{,}000$	$M=800$ $N=8{,}000$	$M=1600$ $N=16{,}000$	$M=3200$ $N=32{,}000$
0	0	1.781E-08	4.448E-09	1.111E-09	2.777E-10	6.940E-11	1.735E-11
0	2	1.789E-08	4.467E-09	1.116E-09	2.789E-10	6.970E-11	1.742E-11
0	4	1.812E-08	4.526E-09	1.131E-09	2.826E-10	7.063E-11	1.765E-11
0	6	1.853E-08	4.627E-09	1.156E-09	2.889E-10	7.220E-11	1.805E-11
0	8	1.912E-08	4.774E-09	1.193E-09	2.980E-10	7.449E-11	1.862E-11
0	10	1.991E-08	4.973E-09	1.242E-09	3.104E-10	7.759E-11	1.940E-11
0	12	2.095E-08	5.232E-09	1.307E-09	3.266E-10	8.163E-11	2.041E-11
0	14	2.227E-08	5.563E-09	1.390E-09	3.473E-10	8.680E-11	2.170E-11
0	16	2.395E-08	5.983E-09	1.495E-09	3.735E-10	9.335E-11	2.334E-11
0	18	2.609E-08	6.516E-09	1.628E-09	4.068E-10	1.017E-10	2.542E-11
0	20	2.881E-08	7.197E-09	1.798E-09	4.494E-10	1.124E-10	2.821E-11
0	22	3.233E-08	8.078E-09	2.020E-09	5.067E-10	1.286E-10	3.405E-11
0	24	3.699E-08	9.267E-09	2.343E-09	6.137E-10	1.815E-10	7.350E-11
0	26	4.362E-08	1.124E-08	3.148E-09	1.127E-09	6.222E-10	4.960E-10
0	28	5.635E-08	1.747E-08	7.765E-09	5.340E-09	4.734E-09	4.582E-09
0	30	1.018E-07	5.349E-08	4.142E-08	3.840E-08	3.765E-08	3.746E-08
0	32	3.409E-07	2.778E-07	2.621E-07	2.582E-07	2.572E-07	2.569E-07
0	34	1.609E-06	1.521E-06	1.498E-06	1.493E-06	1.492E-06	1.491E-06
0	36	7.945E-06	7.804E-06	7.769E-06	7.760E-06	7.758E-06	7.757E-06
0	38	4.306E-05	4.276E-05	4.269E-05	4.267E-05	4.266E-05	4.266E-05
0	40	3.637E-04	3.637E-04	3.637E-04	3.637E-04	3.637E-04	3.637E-04
0	42	6.842E-04	6.847E-04	6.848E-04	6.848E-04	6.848E-04	6.848E-04
0	44	7.194E-04	7.196E-04	7.197E-04	7.197E-04	7.197E-04	7.197E-04
0	46	7.257E-04	7.259E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04
0	48	7.269E-04	7.271E-04	7.272E-04	7.272E-04	7.272E-04	7.272E-04
0	50	7.271E-04	7.273E-04	7.274E-04	7.274E-04	7.274E-04	7.274E-04

^{226}Ra

x [m]	y [m]	$M=50$ $N=16{,}000$	$M=100$ $N=16{,}000$	$M=200$ $N=16{,}000$	$M=400$ $N=16{,}000$	$M=800$ $N=16{,}000$
0	0	9.574E-10	9.525E-10	9.500E-10	9.488E-10	9.479E-10
0	2	1.061E-09	1.056E-09	1.053E-09	1.052E-09	1.051E-09
0	4	1.392E-09	1.387E-09	1.385E-09	1.384E-09	1.383E-09
0	6	2.025E-09	2.019E-09	2.017E-09	2.016E-09	2.015E-09
0	8	3.094E-09	3.089E-09	3.087E-09	3.085E-09	3.084E-09
0	10	4.836E-09	4.831E-09	4.828E-09	4.826E-09	4.825E-09
0	12	7.634E-09	7.628E-09	7.625E-09	7.624E-09	7.622E-09
0	14	1.211E-08	1.211E-08	1.210E-08	1.210E-08	1.210E-08
0	16	1.929E-08	1.928E-08	1.928E-08	1.928E-08	1.928E-08
0	18	3.082E-08	3.082E-08	3.081E-08	3.081E-08	3.081E-08
0	20	4.945E-08	4.944E-08	4.944E-08	4.944E-08	4.944E-08
0	22	7.973E-08	7.972E-08	7.971E-08	7.971E-08	7.971E-08
0	24	1.293E-07	1.293E-07	1.293E-07	1.293E-07	1.293E-07
0	26	2.115E-07	2.114E-07	2.114E-07	2.114E-07	2.114E-07
0	28	3.492E-07	3.492E-07	3.492E-07	3.492E-07	3.492E-07
0	30	5.843E-07	5.843E-07	5.843E-07	5.843E-07	5.843E-07
0	32	9.948E-07	9.948E-07	9.947E-07	9.947E-07	9.947E-07
0	34	1.732E-06	1.732E-06	1.732E-06	1.732E-06	1.732E-06
0	36	3.109E-06	3.109E-06	3.109E-06	3.109E-06	3.109E-06
0	38	5.832E-06	5.832E-06	5.832E-06	5.832E-06	5.832E-06
0	40	1.269E-05	1.269E-05	1.269E-05	1.269E-05	1.269E-05
0	42	1.954E-05	1.954E-05	1.955E-05	1.955E-05	1.955E-05
0	44	2.222E-05	2.223E-05	2.223E-05	2.223E-05	2.223E-05
0	46	2.352E-05	2.353E-05	2.353E-05	2.353E-05	2.353E-05
0	48	2.413E-05	2.413E-05	2.413E-05	2.413E-05	2.413E-05
0	50	2.430E-05	2.431E-05	2.431E-05	2.431E-05	2.431E-05

^{226}Ra

x [m]	y [m]	$M=800$ $N=1{,}000$	$M=800$ $N=2{,}000$	$M=800$ $N=4{,}000$	$M=800$ $N=8{,}000$	$M=800$ $N=16{,}000$
0	0	9.828E-10	9.597E-10	9.528E-10	9.500E-10	9.488E-10
0	2	1.086E-09	1.063E-09	1.056E-09	1.053E-09	1.052E-09
0	4	1.418E-09	1.395E-09	1.388E-09	1.385E-09	1.384E-09
0	6	2.051E-09	2.027E-09	2.020E-09	2.017E-09	2.016E-09
0	8	3.122E-09	3.097E-09	3.089E-09	3.087E-09	3.085E-09
0	10	4.865E-09	4.839E-09	4.831E-09	4.828E-09	4.826E-09
0	12	7.664E-09	7.636E-09	7.628E-09	7.625E-09	7.624E-09
0	14	1.214E-08	1.212E-08	1.211E-08	1.210E-08	1.210E-08
0	16	1.932E-08	1.929E-08	1.928E-08	1.928E-08	1.928E-08
0	18	3.086E-08	3.083E-08	3.082E-08	3.081E-08	3.081E-08
0	20	4.949E-08	4.946E-08	4.944E-08	4.944E-08	4.944E-08
0	22	7.977E-08	7.973E-08	7.972E-08	7.971E-08	7.971E-08
0	24	1.294E-07	1.293E-07	1.293E-07	1.293E-07	1.293E-07
0	26	2.115E-07	2.115E-07	2.114E-07	2.114E-07	2.114E-07
0	28	3.493E-07	3.492E-07	3.492E-07	3.492E-07	3.492E-07
0	30	5.844E-07	5.843E-07	5.843E-07	5.843E-07	5.843E-07
0	32	9.949E-07	9.948E-07	9.948E-07	9.947E-07	9.947E-07
0	34	1.732E-06	1.732E-06	1.732E-06	1.732E-06	1.732E-06
0	36	3.109E-06	3.109E-06	3.109E-06	3.109E-06	3.109E-06
0	38	5.832E-06	5.832E-06	5.832E-06	5.832E-06	5.832E-06
0	40	1.269E-05	1.269E-05	1.269E-05	1.269E-05	1.269E-05
0	42	1.954E-05	1.954E-05	1.955E-05	1.955E-05	1.955E-05
0	44	2.223E-05	2.223E-05	2.223E-05	2.223E-05	2.223E-05
0	46	2.353E-05	2.353E-05	2.353E-05	2.353E-05	2.353E-05
0	48	2.413E-05	2.413E-05	2.413E-05	2.413E-05	2.413E-05
0	50	2.431E-05	2.431E-05	2.431E-05	2.431E-05	2.431E-05

^{226}Ra

x [m]	y [m]	$M=50$ $N=1{,}000$	$M=100$ $N=2{,}000$	$M=200$ $N=4{,}000$	$M=400$ $N=8{,}000$	$M=800$ $N=16{,}000$	$M=1{,}600$ $N=32{,}000$
0	0	1.265E-09	1.027E-09	9.673E-10	9.525E-10	9.488E-10	9.479E-10
0	2	1.370E-09	1.130E-09	1.071E-09	1.056E-09	1.052E-09	1.051E-09
0	4	1.705E-09	1.463E-09	1.402E-09	1.387E-09	1.384E-09	1.383E-09
0	6	2.345E-09	2.097E-09	2.035E-09	2.019E-09	2.016E-09	2.015E-09
0	8	3.425E-09	3.169E-09	3.105E-09	3.089E-09	3.085E-09	3.084E-09
0	10	5.180E-09	4.914E-09	4.847E-09	4.831E-09	4.826E-09	4.825E-09
0	12	7.996E-09	7.715E-09	7.645E-09	7.628E-09	7.624E-09	7.622E-09
0	14	1.250E-08	1.220E-08	1.212E-08	1.211E-08	1.210E-08	1.210E-08
0	16	1.970E-08	1.938E-08	1.930E-08	1.928E-08	1.928E-08	1.928E-08
0	18	3.127E-08	3.093E-08	3.084E-08	3.082E-08	3.081E-08	3.081E-08
0	20	4.995E-08	4.956E-08	4.947E-08	4.944E-08	4.944E-08	4.944E-08
0	22	8.029E-08	7.985E-08	7.975E-08	7.972E-08	7.971E-08	7.971E-08
0	24	1.300E-07	1.295E-07	1.294E-07	1.293E-07	1.293E-07	1.293E-07
0	26	2.122E-07	2.116E-07	2.115E-07	2.114E-07	2.114E-07	2.114E-07
0	28	3.501E-07	3.494E-07	3.492E-07	3.492E-07	3.492E-07	3.492E-07
0	30	5.855E-07	5.846E-07	5.844E-07	5.843E-07	5.843E-07	5.843E-07
0	32	9.962E-07	9.951E-07	9.948E-07	9.948E-07	9.947E-07	9.947E-07
0	34	1.734E-06	1.733E-06	1.732E-06	1.732E-06	1.732E-06	1.732E-06
0	36	3.112E-06	3.110E-06	3.109E-06	3.109E-06	3.109E-06	3.109E-06
0	38	5.835E-06	5.833E-06	5.832E-06	5.832E-06	5.832E-06	5.832E-06
0	40	1.266E-05	1.269E-05	1.269E-05	1.269E-05	1.269E-05	1.269E-05
0	42	1.948E-05	1.954E-05	1.954E-05	1.954E-05	1.955E-05	1.955E-05
0	44	2.216E-05	2.222E-05	2.223E-05	2.223E-05	2.223E-05	2.223E-05
0	46	2.346E-05	2.352E-05	2.353E-05	2.353E-05	2.353E-05	2.353E-05
0	48	2.407E-05	2.413E-05	2.413E-05	2.413E-05	2.413E-05	2.413E-05
0	50	2.424E-05	2.430E-05	2.431E-05	2.431E-05	2.431E-05	2.431E-05

Table S2

Solution convergence at transect of $x = 25$ m for four-species radionuclide transport problem considering simulated domain of $L = 250$ m, $W = 100$ m, subject to Bateman-type sources located at $40\,m \le y \le 60\,m$ for t = 1,000 year (M = number of terms summed for inverse generalized integral transform; N = number of terms summed for inverse finite Fourier cosine transform).

^{238}Pu

x [m]	y [m]	$M = 100$ $N = 160$	$M = 200$ $N = 160$	$M = 400$ $N = 160$	$M = 800$ $N = 160$	$M = 1{,}600$ $N = 160$
25	0	2.091E-10	2.008E-11	1.373E-12	8.329E-14	5.008E-15
25	2	-1.699E-10	-1.632E-11	-1.116E-12	-6.772E-14	-4.072E-15
25	4	6.565E-11	6.327E-12	4.336E-13	2.633E-14	1.583E-15
25	6	6.741E-11	6.435E-12	4.385E-13	2.657E-14	1.597E-15
25	8	-1.818E-10	-1.742E-11	-1.190E-12	-7.215E-14	-4.336E-15
25	10	2.338E-10	2.245E-11	1.535E-12	9.316E-14	5.641E-15
25	12	-1.987E-10	-1.913E-11	-1.310E-12	-7.866E-14	-3.880E-15
25	14	8.029E-11	7.836E-12	5.558E-13	4.915E-14	1.830E-14
25	16	8.787E-11	8.513E-12	8.036E-13	2.779E-13	2.461E-13
25	18	-2.454E-10	-2.071E-11	1.407E-12	2.927E-12	3.019E-12
25	20	3.695E-10	6.361E-11	3.335E-11	3.126E-11	3.113E-11
25	22	-4.005E-11	2.366E-10	2.642E-10	2.661E-10	2.662E-10
25	24	2.028E-09	1.909E-09	1.897E-09	1.896E-09	1.896E-09
25	26	1.142E-08	1.127E-08	1.126E-08	1.126E-08	1.126E-08
25	28	5.531E-08	5.576E-08	5.580E-08	5.580E-08	5.580E-08
25	30	2.319E-07	2.312E-07	2.312E-07	2.311E-07	2.311E-07
25	32	7.993E-07	8.000E-07	8.001E-07	8.001E-07	8.001E-07
25	34	2.311E-06	2.311E-06	2.311E-06	2.311E-06	2.311E-06
25	36	5.553E-06	5.552E-06	5.552E-06	5.552E-06	5.552E-06
25	38	1.106E-05	1.106E-05	1.106E-05	1.106E-05	1.106E-05
25	40	1.831E-05	1.831E-05	1.831E-05	1.831E-05	1.831E-05
25	42	2.556E-05	2.556E-05	2.556E-05	2.556E-05	2.556E-05
25	44	3.107E-05	3.107E-05	3.107E-05	3.107E-05	3.107E-05
25	46	3.430E-05	3.430E-05	3.430E-05	3.430E-05	3.430E-05
25	48	3.577E-05	3.577E-05	3.577E-05	3.577E-05	3.577E-05

25	50	3.616E-05	3.616E-05	3.616E-05	3.616E-05	3.616E-05

^{238}Pu

x [m]	y [m]	$M=1{,}600$ $N=10$	$M=1{,}600$ $N=20$	$M=1{,}600$ $N=40$	$M=1{,}600$ $N=80$	$M=1{,}600$ $N=160$
25	0	3.365E-07	2.071E-08	3.912E-11	2.932E-15	5.008E-15
25	2	2.665E-07	5.602E-09	-3.267E-11	9.214E-16	-4.072E-15
25	4	8.340E-08	-1.799E-08	1.529E-11	-2.398E-15	1.583E-15
25	6	-1.414E-07	-1.564E-08	7.721E-12	-2.486E-15	1.597E-15
25	8	-3.173E-07	1.026E-08	-2.921E-11	9.219E-16	-4.336E-15
25	10	-3.678E-07	2.234E-08	4.221E-11	3.305E-15	5.641E-15
25	12	-2.603E-07	1.225E-09	-4.199E-11	2.045E-15	-3.880E-15
25	14	-2.349E-08	-2.397E-08	2.758E-11	1.345E-14	1.830E-14
25	16	2.564E-07	-1.457E-08	-1.916E-12	2.409E-13	2.461E-13
25	18	4.607E-07	1.946E-08	-2.436E-11	3.026E-12	3.019E-12
25	20	4.801E-07	2.755E-08	8.346E-11	3.113E-11	3.113E-11
25	22	2.626E-07	-8.248E-09	2.019E-10	2.662E-10	2.662E-10
25	24	-1.468E-07	-3.595E-08	1.953E-09	1.896E-09	1.896E-09
25	26	-5.856E-07	2.801E-09	1.123E-08	1.126E-08	1.126E-08
25	28	-7.841E-07	9.961E-08	5.579E-08	5.580E-08	5.580E-08
25	30	-4.063E-07	2.616E-07	2.312E-07	2.311E-07	2.311E-07
25	32	8.832E-07	7.552E-07	7.999E-07	8.001E-07	8.001E-07
25	34	3.340E-06	2.255E-06	2.311E-06	2.311E-06	2.311E-06
25	36	7.064E-06	5.594E-06	5.552E-06	5.552E-06	5.552E-06
25	38	1.195E-05	1.114E-05	1.106E-05	1.106E-05	1.106E-05
25	40	1.766E-05	1.827E-05	1.831E-05	1.831E-05	1.831E-05
25	42	2.369E-05	2.547E-05	2.556E-05	2.556E-05	2.556E-05
25	44	2.937E-05	3.110E-05	3.107E-05	3.107E-05	3.107E-05
25	46	3.404E-05	3.441E-05	3.430E-05	3.430E-05	3.430E-05
25	48	3.710E-05	3.576E-05	3.577E-05	3.577E-05	3.577E-05
25	50	3.817E-05	3.606E-05	3.616E-05	3.616E-05	3.616E-05

^{238}Pu

x [m]	y [m]	$M=100$ $N=10$	$M=200$ $N=20$	$M=400$ $N=40$	$M=800$ $N=80$	$M=1{,}600$ $N=160$	$M=3{,}200$ $N=320$
25	0	3.365E-07	2.071E-08	3.947E-11	4.240E-14	5.008E-15	6.091E-16
25	2	2.665E-07	5.603E-09	-3.296E-11	1.310E-14	-4.072E-15	1.893E-16
25	4	8.340E-08	-1.799E-08	1.540E-11	-3.497E-14	1.583E-15	-5.012E-16
25	6	-1.414E-07	-1.564E-08	7.839E-12	-3.557E-14	1.597E-15	-5.132E-16
25	8	-3.173E-07	1.026E-08	-2.952E-11	1.431E-14	-4.336E-15	2.024E-16
25	10	-3.678E-07	2.234E-08	4.260E-11	4.743E-14	5.641E-15	7.224E-16
25	12	-2.603E-07	1.226E-09	-4.232E-11	1.589E-14	-3.880E-15	1.128E-15
25	14	-2.350E-08	-2.397E-08	2.770E-11	-2.687E-14	1.830E-14	1.571E-14
25	16	2.564E-07	-1.457E-08	-1.753E-12	1.984E-13	2.461E-13	2.434E-13
25	18	4.607E-07	1.946E-08	-2.480E-11	3.045E-12	3.019E-12	3.025E-12
25	20	4.801E-07	2.755E-08	8.403E-11	3.119E-11	3.113E-11	3.112E-11
25	22	2.626E-07	-8.246E-09	2.014E-10	2.662E-10	2.662E-10	2.662E-10
25	24	-1.467E-07	-3.596E-08	1.954E-09	1.896E-09	1.896E-09	1.896E-09
25	26	-5.856E-07	2.795E-09	1.123E-08	1.126E-08	1.126E-08	1.126E-08
25	28	-7.841E-07	9.961E-08	5.579E-08	5.580E-08	5.580E-08	5.580E-08
25	30	-4.064E-07	2.616E-07	2.312E-07	2.311E-07	2.311E-07	2.311E-07
25	32	8.831E-07	7.552E-07	7.999E-07	8.001E-07	8.001E-07	8.001E-07
25	34	3.340E-06	2.255E-06	2.311E-06	2.311E-06	2.311E-06	2.311E-06
25	36	7.064E-06	5.594E-06	5.552E-06	5.552E-06	5.552E-06	5.552E-06
25	38	1.195E-05	1.114E-05	1.106E-05	1.106E-05	1.106E-05	1.106E-05
25	40	1.766E-05	1.827E-05	1.831E-05	1.831E-05	1.831E-05	1.831E-05
25	42	2.369E-05	2.547E-05	2.556E-05	2.556E-05	2.556E-05	2.556E-05
25	44	2.937E-05	3.110E-05	3.107E-05	3.107E-05	3.107E-05	3.107E-05
25	46	3.403E-05	3.441E-05	3.430E-05	3.430E-05	3.430E-05	3.430E-05
25	48	3.710E-05	3.576E-05	3.577E-05	3.577E-05	3.577E-05	3.577E-05
25	50	3.817E-05	3.606E-05	3.616E-05	3.616E-05	3.616E-05	3.616E-05

^{234}U

x [m]	y [m]	$M=100$ $N=160$	$M=200$ $N=160$	$M=400$ $N=160$	$M=800$ $N=160$	$M=1{,}600$ $N=160$
25	0	5.636E-07	5.408E-08	3.697E-09	2.242E-10	1.348E-11
25	2	-4.579E-07	-4.395E-08	-3.005E-09	-1.823E-10	-1.096E-11
25	4	1.769E-07	1.704E-08	1.168E-09	7.088E-11	4.263E-12
25	6	1.817E-07	1.733E-08	1.181E-09	7.153E-11	4.300E-12
25	8	-4.898E-07	-4.691E-08	-3.203E-09	-1.942E-10	-1.168E-11
25	10	6.301E-07	6.046E-08	4.133E-09	2.507E-10	1.507E-11
25	12	-5.356E-07	-5.154E-08	-3.529E-09	-2.142E-10	-1.288E-11
25	14	2.163E-07	2.106E-08	1.453E-09	8.852E-11	5.465E-12
25	16	2.361E-07	2.228E-08	1.510E-09	9.465E-11	9.064E-12
25	18	-6.694E-07	-6.386E-08	-4.283E-09	-1.892E-10	5.899E-11
25	20	9.133E-07	8.882E-08	7.289E-09	1.670E-09	1.329E-09
25	22	-8.066E-07	-6.087E-08	1.337E-08	1.851E-08	1.882E-08
25	24	5.775E-07	2.566E-07	2.238E-07	2.214E-07	2.213E-07
25	26	2.526E-06	2.136E-06	2.099E-06	2.096E-06	2.096E-06
25	28	1.456E-05	1.577E-05	1.589E-05	1.589E-05	1.589E-05
25	30	9.796E-05	9.611E-05	9.593E-05	9.592E-05	9.592E-05
25	32	4.562E-04	4.581E-04	4.583E-04	4.583E-04	4.583E-04
25	34	1.726E-03	1.725E-03	1.724E-03	1.724E-03	1.724E-03
25	36	5.082E-03	5.080E-03	5.080E-03	5.080E-03	5.080E-03
25	38	1.166E-02	1.167E-02	1.167E-02	1.167E-02	1.167E-02
25	40	2.098E-02	2.098E-02	2.098E-02	2.098E-02	2.098E-02
25	42	3.031E-02	3.030E-02	3.030E-02	3.030E-02	3.030E-02
25	44	3.688E-02	3.689E-02	3.689E-02	3.689E-02	3.689E-02
25	46	4.023E-02	4.024E-02	4.024E-02	4.024E-02	4.024E-02
25	48	4.149E-02	4.150E-02	4.150E-02	4.150E-02	4.150E-02
25	50	4.177E-02	4.178E-02	4.178E-02	4.178E-02	4.178E-02

^{234}U

x [m]	y [m]	M =1,600 N =10	M =1,600 N =20	M =1,600 N =40	M =1,600 N =80	M =1,600 N =160
25	0	4.634E-04	4.349E-05	1.190E-07	7.944E-12	1.348E-11
25	2	3.683E-04	1.199E-05	-9.944E-08	2.499E-12	-1.096E-11
25	4	1.191E-04	-3.754E-05	4.656E-08	-6.494E-12	4.263E-12
25	6	-1.886E-04	-3.339E-05	2.346E-08	-6.741E-12	4.300E-12
25	8	-4.329E-04	2.068E-05	-8.886E-08	2.481E-12	-1.168E-11
25	10	-5.092E-04	4.737E-05	1.284E-07	8.840E-12	1.507E-11
25	12	-3.709E-04	4.289E-06	-1.278E-07	3.115E-12	-1.288E-11
25	14	-5.258E-05	-5.006E-05	8.399E-08	-7.624E-12	5.465E-12
25	16	3.336E-04	-3.313E-05	-6.736E-09	-5.163E-12	9.064E-12
25	18	6.291E-04	3.908E-05	-8.310E-08	7.794E-11	5.899E-11
25	20	6.825E-04	6.080E-05	1.605E-07	1.320E-09	1.329E-09
25	22	4.121E-04	-1.361E-05	-1.769E-07	1.885E-08	1.882E-08
25	24	-1.414E-04	-8.207E-05	3.968E-07	2.213E-07	2.213E-07
25	26	-7.873E-04	-2.350E-05	2.001E-06	2.096E-06	2.096E-06
25	28	-1.195E-03	1.097E-04	1.586E-05	1.589E-05	1.589E-05
25	30	-9.427E-04	1.728E-04	9.610E-05	9.592E-05	9.592E-05
25	32	3.957E-04	3.639E-04	4.580E-04	4.583E-04	4.583E-04
25	34	3.154E-03	1.588E-03	1.725E-03	1.724E-03	1.724E-03
25	36	7.474E-03	5.169E-03	5.079E-03	5.080E-03	5.080E-03
25	38	1.324E-02	1.186E-02	1.167E-02	1.167E-02	1.167E-02
25	40	2.007E-02	2.090E-02	2.098E-02	2.098E-02	2.098E-02
25	42	2.732E-02	3.007E-02	3.030E-02	3.030E-02	3.030E-02
25	44	3.418E-02	3.695E-02	3.689E-02	3.689E-02	3.689E-02
25	46	3.984E-02	4.049E-02	4.024E-02	4.024E-02	4.024E-02
25	48	4.357E-02	4.147E-02	4.150E-02	4.150E-02	4.150E-02
25	50	4.487E-02	4.153E-02	4.178E-02	4.178E-02	4.178E-02

^{234}U

x [m]	y [m]	$M=100$ $N=10$	$M=200$ $N=20$	$M=400$ $N=40$	$M=800$ $N=80$	$M=1{,}600$ $N=160$	$M=3{,}200$ $N=320$
25	0	4.633E-04	4.350E-05	1.200E-07	1.137E-10	1.348E-11	1.642E-12
25	2	3.683E-04	1.200E-05	-1.002E-07	3.514E-11	-1.096E-11	5.103E-13
25	4	1.191E-04	-3.755E-05	4.685E-08	-9.378E-11	4.263E-12	-1.351E-12
25	6	-1.886E-04	-3.340E-05	2.377E-08	-9.539E-11	4.300E-12	-1.383E-12
25	8	-4.329E-04	2.068E-05	-8.967E-08	3.835E-11	-1.168E-11	5.417E-13
25	10	-5.092E-04	4.737E-05	1.295E-07	1.271E-10	1.507E-11	1.836E-12
25	12	-3.709E-04	4.292E-06	-1.287E-07	4.019E-11	-1.288E-11	6.071E-13
25	14	-5.260E-05	-5.007E-05	8.432E-08	-1.157E-10	5.465E-12	-1.510E-12
25	16	3.336E-04	-3.314E-05	-6.305E-09	-1.189E-10	9.064E-12	1.803E-12
25	18	6.290E-04	3.908E-05	-8.424E-08	1.286E-10	5.899E-11	7.560E-11
25	20	6.825E-04	6.081E-05	1.620E-07	1.491E-09	1.329E-09	1.310E-09
25	22	4.121E-04	-1.360E-05	-1.782E-07	1.890E-08	1.882E-08	1.884E-08
25	24	-1.413E-04	-8.208E-05	3.973E-07	2.211E-07	2.213E-07	2.213E-07
25	26	-7.871E-04	-2.352E-05	2.002E-06	2.096E-06	2.096E-06	2.096E-06
25	28	-1.194E-03	1.097E-04	1.586E-05	1.589E-05	1.589E-05	1.589E-05
25	30	-9.427E-04	1.728E-04	9.611E-05	9.592E-05	9.592E-05	9.592E-05
25	32	3.955E-04	3.639E-04	4.580E-04	4.583E-04	4.583E-04	4.583E-04
25	34	3.153E-03	1.588E-03	1.725E-03	1.724E-03	1.724E-03	1.724E-03
25	36	7.473E-03	5.169E-03	5.079E-03	5.080E-03	5.080E-03	5.080E-03
25	38	1.324E-02	1.186E-02	1.167E-02	1.167E-02	1.167E-02	1.167E-02
25	40	2.007E-02	2.090E-02	2.098E-02	2.098E-02	2.098E-02	2.098E-02
25	42	2.731E-02	3.007E-02	3.030E-02	3.030E-02	3.030E-02	3.030E-02
25	44	3.418E-02	3.695E-02	3.689E-02	3.689E-02	3.689E-02	3.689E-02
25	46	3.984E-02	4.049E-02	4.024E-02	4.024E-02	4.024E-02	4.024E-02
25	48	4.357E-02	4.147E-02	4.150E-02	4.150E-02	4.150E-02	4.150E-02
25	50	4.487E-02	4.153E-02	4.178E-02	4.178E-02	4.178E-02	4.178E-02

^{230}Th

x [m]	y [m]	$M=100$ $N=160$	$M=200$ $N=160$	$M=400$ $N=160$	$M=800$ $N=160$	$M=1{,}600$ $N=160$
25	0	2.048E-09	1.967E-10	1.346E-11	8.165E-13	4.916E-14
25	2	-1.664E-09	-1.599E-10	-1.094E-11	-6.637E-13	-3.985E-14
25	4	6.429E-10	6.199E-11	4.250E-12	2.581E-13	1.557E-14
25	6	6.602E-10	6.305E-11	4.298E-12	2.605E-13	1.568E-14
25	8	-1.780E-09	-1.707E-10	-1.166E-11	-7.072E-13	-4.252E-14
25	10	2.290E-09	2.199E-10	1.505E-11	9.128E-13	5.489E-14
25	12	-1.946E-09	-1.875E-10	-1.285E-11	-7.799E-13	-4.690E-14
25	14	7.861E-10	7.662E-11	5.287E-12	3.217E-13	1.937E-14
25	16	8.581E-10	8.103E-11	5.485E-12	3.318E-13	2.011E-14
25	18	-2.433E-09	-2.326E-10	-1.586E-11	-9.571E-13	-5.334E-14
25	20	3.314E-09	3.184E-10	2.186E-11	1.408E-12	1.668E-13
25	22	-2.998E-09	-2.885E-10	-1.849E-11	2.151E-13	1.352E-12
25	24	1.313E-09	1.474E-10	2.807E-11	1.968E-11	1.916E-11
25	26	1.770E-09	3.538E-10	2.189E-10	2.099E-10	2.093E-10
25	28	-2.998E-09	1.387E-09	1.816E-09	1.846E-09	1.847E-09
25	30	2.046E-08	1.376E-08	1.310E-08	1.305E-08	1.305E-08
25	32	6.522E-08	7.223E-08	7.294E-08	7.299E-08	7.299E-08
25	34	3.234E-07	3.198E-07	3.194E-07	3.193E-07	3.193E-07
25	36	1.082E-06	1.075E-06	1.075E-06	1.075E-06	1.075E-06
25	38	2.696E-06	2.731E-06	2.735E-06	2.735E-06	2.735E-06
25	40	5.229E-06	5.236E-06	5.237E-06	5.237E-06	5.237E-06
25	42	7.778E-06	7.742E-06	7.739E-06	7.739E-06	7.739E-06
25	44	9.382E-06	9.398E-06	9.399E-06	9.399E-06	9.399E-06
25	46	1.014E-05	1.015E-05	1.015E-05	1.015E-05	1.015E-05
25	48	1.041E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05
25	50	1.042E-05	1.045E-05	1.045E-05	1.045E-05	1.045E-05

^{230}Th

x [m]	y [m]	M =1,600 N =10	M =1,600 N =20	M =1,600 N =40	M =1,600 N =80	M =1,600 N =160
25	0	1.267E-07	1.544E-08	8.473E-11	2.675E-14	4.916E-14
25	2	1.009E-07	4.323E-09	-7.063E-11	8.373E-15	-3.985E-14
25	4	3.316E-08	-1.326E-08	3.262E-11	-2.187E-14	1.557E-14
25	6	-5.069E-08	-1.200E-08	1.759E-11	-2.247E-14	1.568E-14
25	8	-1.177E-07	7.085E-09	-6.422E-11	8.710E-15	-4.252E-14
25	10	-1.395E-07	1.692E-08	9.196E-11	2.976E-14	5.489E-14
25	12	-1.031E-07	2.023E-09	-9.055E-11	9.885E-15	-4.690E-14
25	14	-1.730E-08	-1.762E-08	5.798E-11	-2.669E-14	1.937E-14
25	16	8.820E-08	-1.247E-08	-1.668E-12	-2.886E-14	2.011E-14
25	18	1.708E-07	1.322E-08	-6.307E-11	1.605E-14	-5.334E-14
25	20	1.891E-07	2.233E-08	1.169E-10	1.300E-13	1.668E-13
25	22	1.198E-07	-3.376E-09	-1.395E-10	1.440E-12	1.352E-12
25	24	-2.875E-08	-2.966E-08	1.422E-10	1.909E-11	1.916E-11
25	26	-2.083E-07	-1.154E-08	1.483E-10	2.092E-10	2.093E-10
25	28	-3.336E-07	3.484E-08	1.811E-09	1.847E-09	1.847E-09
25	30	-2.948E-07	4.484E-08	1.320E-08	1.305E-08	1.305E-08
25	32	2.021E-08	4.089E-08	7.274E-08	7.299E-08	7.299E-08
25	34	7.000E-07	2.632E-07	3.196E-07	3.193E-07	3.193E-07
25	36	1.784E-06	1.104E-06	1.074E-06	1.075E-06	1.075E-06
25	38	3.246E-06	2.816E-06	2.735E-06	2.735E-06	2.735E-06
25	40	4.984E-06	5.207E-06	5.237E-06	5.237E-06	5.237E-06
25	42	6.837E-06	7.644E-06	7.739E-06	7.739E-06	7.739E-06
25	44	8.597E-06	9.425E-06	9.399E-06	9.399E-06	9.399E-06
25	46	1.005E-05	1.025E-05	1.015E-05	1.015E-05	1.015E-05
25	48	1.101E-05	1.039E-05	1.040E-05	1.040E-05	1.040E-05
25	50	1.134E-05	1.035E-05	1.045E-05	1.045E-05	1.045E-05

^{230}Th

x [m]	y [m]	$M=100$ $N=10$	$M=100$ $N=10$	$M=200$ $N=20$	$M=400$ $N=40$	$M=800$ $N=80$	$M=1600$ $N=160$
25	0	1.269E-07	1.547E-08	8.830E-11	4.156E-13	4.916E-14	6.032E-15
25	2	1.011E-07	4.332E-09	-7.352E-11	1.284E-13	-3.985E-14	1.916E-15
25	4	3.325E-08	-1.328E-08	3.371E-11	-3.428E-13	1.557E-14	-4.861E-15
25	6	-5.074E-08	-1.203E-08	1.878E-11	-3.485E-13	1.568E-14	-5.001E-15
25	8	-1.179E-07	7.094E-09	-6.735E-11	1.405E-13	-4.252E-14	1.972E-15
25	10	-1.398E-07	1.695E-08	9.595E-11	4.645E-13	5.489E-14	6.667E-15
25	12	-1.034E-07	2.036E-09	-9.388E-11	1.464E-13	-4.690E-14	2.190E-15
25	14	-1.745E-08	-1.765E-08	5.924E-11	-4.240E-13	1.937E-14	-6.005E-15
25	16	8.822E-08	-1.250E-08	-3.339E-14	-4.472E-13	2.011E-14	-6.312E-15
25	18	1.710E-07	1.323E-08	-6.742E-11	2.021E-13	-5.334E-14	7.122E-15
25	20	1.895E-07	2.238E-08	1.226E-10	7.592E-13	1.668E-13	9.697E-14
25	22	1.202E-07	-3.352E-09	-1.445E-10	1.641E-12	1.352E-12	1.428E-12
25	24	-2.838E-08	-2.970E-08	1.441E-10	1.842E-11	1.916E-11	1.912E-11
25	26	-2.082E-07	-1.160E-08	1.515E-10	2.085E-10	2.093E-10	2.093E-10
25	28	-3.339E-07	3.486E-08	1.803E-09	1.848E-09	1.847E-09	1.847E-09
25	30	-2.957E-07	4.496E-08	1.321E-08	1.305E-08	1.305E-08	1.305E-08
25	32	1.861E-08	4.097E-08	7.273E-08	7.299E-08	7.299E-08	7.299E-08
25	34	6.977E-07	2.631E-07	3.197E-07	3.193E-07	3.193E-07	3.193E-07
25	36	1.781E-06	1.104E-06	1.074E-06	1.075E-06	1.075E-06	1.075E-06
25	38	3.242E-06	2.815E-06	2.735E-06	2.735E-06	2.735E-06	2.735E-06
25	40	4.980E-06	5.206E-06	5.237E-06	5.237E-06	5.237E-06	5.237E-06
25	42	6.832E-06	7.644E-06	7.739E-06	7.739E-06	7.739E-06	7.739E-06
25	44	8.592E-06	9.425E-06	9.399E-06	9.399E-06	9.399E-06	9.399E-06
25	46	1.005E-05	1.025E-05	1.015E-05	1.015E-05	1.015E-05	1.015E-05
25	48	1.100E-05	1.039E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05
25	50	1.134E-05	1.035E-05	1.045E-05	1.045E-05	1.045E-05	1.045E-05

^{226}Ra

x [m]	y [m]	$M=25$ $N=160$	$M=50$ $N=160$	$M=100$ $N=160$	$M=200$ $N=160$	$M=400$ $N=160$
25	0	4.407E-09	5.642E-09	5.792E-09	5.775E-09	5.774E-09
25	2	7.482E-09	6.480E-09	6.358E-09	6.372E-09	6.373E-09
25	4	7.864E-09	8.251E-09	8.298E-09	8.292E-09	8.292E-09
25	6	1.147E-08	1.187E-08	1.192E-08	1.192E-08	1.191E-08
25	8	1.915E-08	1.808E-08	1.795E-08	1.796E-08	1.797E-08
25	10	2.613E-08	2.751E-08	2.767E-08	2.765E-08	2.765E-08
25	12	4.420E-08	4.303E-08	4.288E-08	4.290E-08	4.290E-08
25	14	6.622E-08	6.669E-08	6.675E-08	6.674E-08	6.674E-08
25	16	1.033E-07	1.038E-07	1.039E-07	1.039E-07	1.039E-07
25	18	1.633E-07	1.618E-07	1.616E-07	1.617E-07	1.617E-07
25	20	2.492E-07	2.512E-07	2.514E-07	2.514E-07	2.514E-07
25	22	3.925E-07	3.907E-07	3.905E-07	3.905E-07	3.905E-07
25	24	6.048E-07	6.055E-07	6.056E-07	6.056E-07	6.056E-07
25	26	9.360E-07	9.370E-07	9.371E-07	9.371E-07	9.371E-07
25	28	1.448E-06	1.445E-06	1.444E-06	1.444E-06	1.444E-06
25	30	2.208E-06	2.212E-06	2.213E-06	2.213E-06	2.213E-06
25	32	3.360E-06	3.355E-06	3.355E-06	3.355E-06	3.355E-06
25	34	5.001E-06	5.002E-06	5.002E-06	5.002E-06	5.002E-06
25	36	7.268E-06	7.262E-06	7.262E-06	7.262E-06	7.262E-06
25	38	1.025E-05	1.013E-05	1.013E-05	1.013E-05	1.013E-05
25	40	1.356E-05	1.338E-05	1.337E-05	1.337E-05	1.337E-05
25	42	1.681E-05	1.657E-05	1.656E-05	1.656E-05	1.656E-05
25	44	1.964E-05	1.928E-05	1.927E-05	1.927E-05	1.927E-05
25	46	2.161E-05	2.125E-05	2.123E-05	2.123E-05	2.123E-05
25	48	2.276E-05	2.240E-05	2.239E-05	2.239E-05	2.239E-05
25	50	2.316E-05	2.278E-05	2.277E-05	2.277E-05	2.277E-05

^{226}Ra

x [m]	y [m]	$M=400$ $N=10$	$M=400$ $N=20$	$M=400$ $N=40$	$M=400$ $N=80$	$M=400$ $N=160$
25	0	8.213E-08	8.219E-09	5.778E-09	5.773E-09	5.774E-09
25	2	6.616E-08	7.029E-09	6.369E-09	6.373E-09	6.373E-09
25	4	2.509E-08	6.163E-09	8.294E-09	8.292E-09	8.292E-09
25	6	-2.302E-08	1.008E-08	1.192E-08	1.191E-08	1.191E-08
25	8	-5.552E-08	1.919E-08	1.796E-08	1.797E-08	1.797E-08
25	10	-5.355E-08	3.027E-08	2.766E-08	2.765E-08	2.765E-08
25	12	-9.356E-09	4.301E-08	4.290E-08	4.290E-08	4.290E-08
25	14	7.068E-08	6.392E-08	6.675E-08	6.674E-08	6.674E-08
25	16	1.687E-07	1.022E-07	1.039E-07	1.039E-07	1.039E-07
25	18	2.642E-07	1.640E-07	1.617E-07	1.617E-07	1.617E-07
25	20	3.464E-07	2.546E-07	2.514E-07	2.514E-07	2.514E-07
25	22	4.278E-07	3.894E-07	3.905E-07	3.905E-07	3.905E-07
25	24	5.536E-07	6.012E-07	6.056E-07	6.056E-07	6.056E-07
25	26	8.040E-07	9.362E-07	9.371E-07	9.371E-07	9.371E-07
25	28	1.287E-06	1.449E-06	1.444E-06	1.444E-06	1.444E-06
25	30	2.120E-06	2.216E-06	2.213E-06	2.213E-06	2.213E-06
25	32	3.406E-06	3.350E-06	3.355E-06	3.355E-06	3.355E-06
25	34	5.207E-06	4.996E-06	5.002E-06	5.002E-06	5.002E-06
25	36	7.517E-06	7.267E-06	7.262E-06	7.262E-06	7.262E-06
25	38	1.025E-05	1.014E-05	1.013E-05	1.013E-05	1.013E-05
25	40	1.324E-05	1.336E-05	1.337E-05	1.337E-05	1.337E-05
25	42	1.624E-05	1.655E-05	1.656E-05	1.656E-05	1.656E-05
25	44	1.898E-05	1.927E-05	1.927E-05	1.927E-05	1.927E-05
25	46	2.119E-05	2.124E-05	2.123E-05	2.123E-05	2.123E-05
25	48	2.262E-05	2.239E-05	2.239E-05	2.239E-05	2.239E-05
25	50	2.311E-05	2.275E-05	2.277E-05	2.277E-05	2.277E-05

^{226}Ra

x [m]	y [m]	$M=25$ $N=10$	$M=50$ $N=20$	$M=100$ $N=40$	$M=200$ $N=80$	$M=400$ $N=160$	$M=800$ $N=320$
25	0	8.713E-08	8.228E-09	5.787E-09	5.774E-09	5.774E-09	5.773E-09
25	2	7.014E-08	7.030E-09	6.362E-09	6.373E-09	6.373E-09	6.373E-09
25	4	2.640E-08	6.153E-09	8.296E-09	8.291E-09	8.292E-09	8.292E-09
25	6	-2.502E-08	1.008E-08	1.192E-08	1.191E-08	1.191E-08	1.191E-08
25	8	-6.016E-08	1.921E-08	1.795E-08	1.797E-08	1.797E-08	1.797E-08
25	10	-5.907E-08	3.028E-08	2.767E-08	2.765E-08	2.765E-08	2.765E-08
25	12	-1.345E-08	4.300E-08	4.289E-08	4.290E-08	4.290E-08	4.290E-08
25	14	6.998E-08	6.390E-08	6.675E-08	6.674E-08	6.674E-08	6.674E-08
25	16	1.722E-07	1.022E-07	1.039E-07	1.039E-07	1.039E-07	1.039E-07
25	18	2.710E-07	1.640E-07	1.616E-07	1.617E-07	1.617E-07	1.617E-07
25	20	3.540E-07	2.546E-07	2.514E-07	2.514E-07	2.514E-07	2.514E-07
25	22	4.327E-07	3.894E-07	3.905E-07	3.905E-07	3.905E-07	3.905E-07
25	24	5.525E-07	6.012E-07	6.056E-07	6.056E-07	6.056E-07	6.056E-07
25	26	7.955E-07	9.362E-07	9.371E-07	9.371E-07	9.371E-07	9.371E-07
25	28	1.273E-06	1.450E-06	1.444E-06	1.444E-06	1.444E-06	1.444E-06
25	30	2.106E-06	2.216E-06	2.213E-06	2.213E-06	2.213E-06	2.213E-06
25	32	3.403E-06	3.349E-06	3.355E-06	3.355E-06	3.355E-06	3.355E-06
25	34	5.228E-06	4.996E-06	5.002E-06	5.002E-06	5.002E-06	5.002E-06
25	36	7.578E-06	7.268E-06	7.262E-06	7.262E-06	7.262E-06	7.262E-06
25	38	1.036E-05	1.014E-05	1.013E-05	1.013E-05	1.013E-05	1.013E-05
25	40	1.342E-05	1.337E-05	1.337E-05	1.337E-05	1.337E-05	1.337E-05
25	42	1.649E-05	1.656E-05	1.656E-05	1.656E-05	1.656E-05	1.656E-05
25	44	1.930E-05	1.929E-05	1.927E-05	1.927E-05	1.927E-05	1.927E-05
25	46	2.156E-05	2.126E-05	2.123E-05	2.123E-05	2.123E-05	2.123E-05
25	48	2.302E-05	2.240E-05	2.239E-05	2.239E-05	2.239E-05	2.239E-05
25	50	2.353E-05	2.277E-05	2.277E-05	2.277E-05	2.277E-05	2.277E-05

Table S.3

Solution convergence at transect of exit boundary ($x = 250$ m) for four-species radionuclide transport problem considering simulated domain of $L = 250$ m, $W = 100$ m subject to Bateman-type sources located at $40\,m \le y \le 60\,m$ for t = 1000 year (M = number of terms summed for inverse generalized integral transform and N = number of terms summed for inverse finite Fourier cosine transform).

^{226}Ra

x [m]	y [m]	$M = 400$ $N = 16$	$M = 800$ $N = 16$	$M = 1{,}600$ $N = 16$	$M = 3{,}200$ $N = 16$	$M = 6{,}400$ $N = 16$
250	0	1.897E-08	1.759E-08	1.751E-08	1.750E-08	1.750E-08
250	2	1.878E-08	1.816E-08	1.812E-08	1.812E-08	1.812E-08
250	4	1.911E-08	1.993E-08	1.998E-08	1.998E-08	1.998E-08
250	6	2.166E-08	2.304E-08	2.313E-08	2.314E-08	2.314E-08
250	8	2.720E-08	2.762E-08	2.765E-08	2.765E-08	2.765E-08
250	10	3.472E-08	3.367E-08	3.361E-08	3.360E-08	3.360E-08
250	12	4.260E-08	4.119E-08	4.110E-08	4.110E-08	4.110E-08
250	14	5.041E-08	5.023E-08	5.022E-08	5.022E-08	5.022E-08
250	16	5.961E-08	6.097E-08	6.106E-08	6.106E-08	6.106E-08
250	18	7.213E-08	7.358E-08	7.367E-08	7.367E-08	7.367E-08
250	20	8.827E-08	8.809E-08	8.807E-08	8.807E-08	8.807E-08
250	22	1.062E-07	1.043E-07	1.042E-07	1.042E-07	1.042E-07
250	24	1.235E-07	1.221E-07	1.220E-07	1.220E-07	1.220E-07
250	26	1.403E-07	1.412E-07	1.413E-07	1.413E-07	1.413E-07
250	28	1.590E-07	1.616E-07	1.617E-07	1.617E-07	1.617E-07
250	30	1.820E-07	1.830E-07	1.831E-07	1.831E-07	1.831E-07
250	32	2.081E-07	2.050E-07	2.048E-07	2.048E-07	2.048E-07
250	34	2.309E-07	2.268E-07	2.265E-07	2.265E-07	2.265E-07
250	36	2.424E-07	2.472E-07	2.475E-07	2.475E-07	2.475E-07
250	38	2.388E-07	2.656E-07	2.673E-07	2.674E-07	2.674E-07
250	40	2.237E-07	2.816E-07	2.852E-07	2.854E-07	2.855E-07
250	42	2.070E-07	2.953E-07	3.008E-07	3.011E-07	3.011E-07
250	44	1.981E-07	3.067E-07	3.135E-07	3.139E-07	3.140E-07
250	46	1.996E-07	3.157E-07	3.230E-07	3.234E-07	3.234E-07

250	48	2.060E-07	3.216E-07	3.288E-07	3.292E-07	3.293E-07
250	50	2.094E-07	3.236E-07	3.308E-07	3.312E-07	3.312E-07

^{226}Ra

x [m]	y [m]	$M=6{,}400$ $N=1$	$M=6{,}400$ $N=2$	$M=6{,}400$ $N=4$	$M=6{,}400$ $N=8$	$M=6{,}400$ $N=16$
250	0	1.529E-07	-3.078E-09	1.837E-08	1.750E-08	1.750E-08
250	2	1.529E-07	-1.848E-09	1.892E-08	1.812E-08	1.812E-08
250	4	1.529E-07	1.823E-09	2.062E-08	1.998E-08	1.998E-08
250	6	1.529E-07	7.876E-09	2.351E-08	2.314E-08	2.314E-08
250	8	1.529E-07	1.622E-08	2.771E-08	2.765E-08	2.765E-08
250	10	1.529E-07	2.671E-08	3.334E-08	3.360E-08	3.360E-08
250	12	1.529E-07	3.920E-08	4.055E-08	4.110E-08	4.110E-08
250	14	1.529E-07	5.348E-08	4.946E-08	5.022E-08	5.022E-08
250	16	1.529E-07	6.933E-08	6.020E-08	6.106E-08	6.106E-08
250	18	1.529E-07	8.650E-08	7.282E-08	7.367E-08	7.367E-08
250	20	1.529E-07	1.047E-07	8.736E-08	8.807E-08	8.807E-08
250	22	1.529E-07	1.237E-07	1.037E-07	1.042E-07	1.042E-07
250	24	1.529E-07	1.431E-07	1.218E-07	1.220E-07	1.220E-07
250	26	1.529E-07	1.627E-07	1.414E-07	1.413E-07	1.413E-07
250	28	1.529E-07	1.821E-07	1.622E-07	1.617E-07	1.617E-07
250	30	1.529E-07	2.011E-07	1.838E-07	1.831E-07	1.831E-07
250	32	1.529E-07	2.193E-07	2.057E-07	2.048E-07	2.048E-07
250	34	1.529E-07	2.365E-07	2.274E-07	2.265E-07	2.265E-07
250	36	1.529E-07	2.523E-07	2.483E-07	2.475E-07	2.475E-07
250	38	1.529E-07	2.666E-07	2.680E-07	2.674E-07	2.674E-07
250	40	1.529E-07	2.791E-07	2.857E-07	2.855E-07	2.855E-07
250	42	1.529E-07	2.896E-07	3.011E-07	3.011E-07	3.011E-07
250	44	1.529E-07	2.979E-07	3.136E-07	3.140E-07	3.140E-07
250	46	1.529E-07	3.040E-07	3.228E-07	3.234E-07	3.234E-07
250	48	1.529E-07	3.077E-07	3.284E-07	3.293E-07	3.293E-07
250	50	1.529E-07	3.089E-07	3.303E-07	3.312E-07	3.312E-07

^{226}Ra

x [m]	y [m]	$M=400$ $N=1$	$M=800$ $N=2$	$M=1{,}600$ $N=4$	$M=3{,}200$ $N=8$	$M=6{,}400$ $N=16$	$M=12{,}800$ $N=32$
250	0	1.286E-07	-1.779E-09	1.831E-08	1.750E-08	1.750E-08	1.750E-08
250	2	1.286E-07	-5.717E-10	1.887E-08	1.812E-08	1.812E-08	1.812E-08
250	4	1.286E-07	3.033E-09	2.057E-08	1.998E-08	1.998E-08	1.998E-08
250	6	1.286E-07	8.977E-09	2.348E-08	2.314E-08	2.314E-08	2.314E-08
250	8	1.286E-07	1.717E-08	2.769E-08	2.765E-08	2.765E-08	2.765E-08
250	10	1.286E-07	2.747E-08	3.335E-08	3.360E-08	3.360E-08	3.360E-08
250	12	1.286E-07	3.974E-08	4.057E-08	4.110E-08	4.110E-08	4.110E-08
250	14	1.286E-07	5.376E-08	4.951E-08	5.022E-08	5.022E-08	5.022E-08
250	16	1.286E-07	6.932E-08	6.026E-08	6.106E-08	6.106E-08	6.106E-08
250	18	1.286E-07	8.618E-08	7.289E-08	7.367E-08	7.367E-08	7.367E-08
250	20	1.286E-07	1.041E-07	8.743E-08	8.807E-08	8.807E-08	8.807E-08
250	22	1.286E-07	1.227E-07	1.038E-07	1.042E-07	1.042E-07	1.042E-07
250	24	1.286E-07	1.418E-07	1.219E-07	1.220E-07	1.220E-07	1.220E-07
250	26	1.286E-07	1.610E-07	1.415E-07	1.413E-07	1.413E-07	1.413E-07
250	28	1.286E-07	1.801E-07	1.622E-07	1.617E-07	1.617E-07	1.617E-07
250	30	1.286E-07	1.987E-07	1.837E-07	1.831E-07	1.831E-07	1.831E-07
250	32	1.286E-07	2.166E-07	2.056E-07	2.048E-07	2.048E-07	2.048E-07
250	34	1.286E-07	2.335E-07	2.272E-07	2.265E-07	2.265E-07	2.265E-07
250	36	1.286E-07	2.490E-07	2.481E-07	2.475E-07	2.475E-07	2.475E-07
250	38	1.286E-07	2.631E-07	2.677E-07	2.674E-07	2.674E-07	2.674E-07
250	40	1.286E-07	2.753E-07	2.855E-07	2.854E-07	2.855E-07	2.855E-07
250	42	1.286E-07	2.856E-07	3.008E-07	3.011E-07	3.011E-07	3.012E-07
250	44	1.286E-07	2.938E-07	3.132E-07	3.139E-07	3.140E-07	3.140E-07
250	46	1.286E-07	2.998E-07	3.224E-07	3.234E-07	3.234E-07	3.234E-07
250	48	1.286E-07	3.034E-07	3.280E-07	3.292E-07	3.293E-07	3.293E-07
250	50	1.286E-07	3.046E-07	3.299E-07	3.312E-07	3.312E-07	3.312E-07

Table S4

Solution convergence at transect of inlet boundary ($x = 0$ m) for four-species radionuclide transport problem considering simulated domain of $L = 2{,}500$ m, $W = 100$ m subject to Bateman-type sources located at $45\,m \le y \le 55\,m$ for t = 1,000 year (M = number of terms summed for inverse generalized integral transform; N = number of terms summed for inverse finite Fourier cosine transform).

^{238}Pu

x [m]	y [m]	$M = 400$ $N = 32{,}000$	$M = 800$ $N = 32{,}000$	$M = 1{,}600$ $N = 32{,}000$	$M = 3{,}200$ $N = 32{,}000$	$M = 6{,}400$ $N = 32{,}000$
0	0	6.766E-11	3.398E-11	1.701E-11	8.506E-12	4.255E-12
0	2	6.794E-11	3.412E-11	1.708E-11	8.541E-12	4.272E-12
0	4	6.877E-11	3.454E-11	1.729E-11	8.646E-12	4.325E-12
0	6	7.019E-11	3.525E-11	1.764E-11	8.824E-12	4.414E-12
0	8	7.224E-11	3.628E-11	1.816E-11	9.082E-12	4.543E-12
0	10	7.501E-11	3.767E-11	1.885E-11	9.429E-12	4.717E-12
0	12	7.858E-11	3.946E-11	1.975E-11	9.879E-12	4.942E-12
0	14	8.311E-11	4.174E-11	2.089E-11	1.045E-11	5.226E-12
0	16	8.879E-11	4.459E-11	2.232E-11	1.116E-11	5.584E-12
0	18	9.589E-11	4.816E-11	2.410E-11	1.206E-11	6.033E-12
0	20	1.048E-10	5.268E-11	2.639E-11	1.323E-11	6.647E-12
0	22	1.168E-10	5.905E-11	2.996E-11	1.539E-11	8.104E-12
0	24	1.395E-10	7.471E-11	4.204E-11	2.568E-11	1.750E-11
0	26	2.378E-10	1.638E-10	1.266E-10	1.079E-10	9.855E-11
0	28	8.877E-10	8.016E-10	7.583E-10	7.365E-10	7.257E-10
0	30	5.014E-09	4.912E-09	4.860E-09	4.835E-09	4.822E-09
0	32	2.753E-08	2.740E-08	2.734E-08	2.731E-08	2.729E-08
0	34	1.315E-07	1.313E-07	1.312E-07	1.312E-07	1.312E-07
0	36	5.391E-07	5.389E-07	5.387E-07	5.387E-07	5.387E-07
0	38	1.908E-06	1.908E-06	1.907E-06	1.907E-06	1.907E-06
0	40	5.908E-06	5.908E-06	5.908E-06	5.908E-06	5.908E-06
0	42	1.640E-05	1.642E-05	1.642E-05	1.642E-05	1.642E-05
0	44	4.305E-05	4.373E-05	4.377E-05	4.377E-05	4.377E-05
0	45	8.173E-05	8.186E-05	8.187E-05	8.187E-05	8.187E-05

0	46	1.203E-04	1.199E-04	1.198E-04	1.198E-04	1.199E-04
0	48	1.457E-04	1.459E-04	1.459E-04	1.459E-04	1.459E-04
0	50	1.522E-04	1.524E-04	1.525E-04	1.525E-04	1.525E-04

^{238}Pu

x [m]	y [m]	$M=6400$ $N=2{,}000$	$M=6400$ $N=4{,}000$	$M=6400$ $N=8{,}000$	$M=6400$ $N=16{,}000$	$M=6400$ $N=32{,}000$
0	0	7.852E-11	3.538E-11	1.718E-11	8.527E-12	4.255E-12
0	2	7.884E-11	3.552E-11	1.725E-11	8.561E-12	4.272E-12
0	4	7.981E-11	3.596E-11	1.746E-11	8.666E-12	4.325E-12
0	6	8.145E-11	3.670E-11	1.782E-11	8.845E-12	4.414E-12
0	8	8.384E-11	3.778E-11	1.834E-11	9.104E-12	4.543E-12
0	10	8.704E-11	3.922E-11	1.905E-11	9.452E-12	4.717E-12
0	12	9.119E-11	4.109E-11	1.995E-11	9.902E-12	4.942E-12
0	14	9.645E-11	4.346E-11	2.110E-11	1.047E-11	5.226E-12
0	16	1.030E-10	4.643E-11	2.255E-11	1.119E-11	5.584E-12
0	18	1.113E-10	5.014E-11	2.435E-11	1.209E-11	6.033E-12
0	20	1.216E-10	5.484E-11	2.666E-11	1.326E-11	6.647E-12
0	22	1.354E-10	6.145E-11	3.026E-11	1.542E-11	8.104E-12
0	24	1.604E-10	7.740E-11	4.238E-11	2.572E-11	1.750E-11
0	26	2.617E-10	1.669E-10	1.269E-10	1.079E-10	9.855E-11
0	28	9.154E-10	8.052E-10	7.587E-10	7.366E-10	7.257E-10
0	30	5.047E-09	4.916E-09	4.861E-09	4.835E-09	4.822E-09
0	32	2.757E-08	2.741E-08	2.734E-08	2.731E-08	2.729E-08
0	34	1.315E-07	1.313E-07	1.312E-07	1.312E-07	1.312E-07
0	36	5.391E-07	5.389E-07	5.387E-07	5.387E-07	5.387E-07
0	38	1.908E-06	1.908E-06	1.907E-06	1.907E-06	1.907E-06
0	40	5.909E-06	5.908E-06	5.908E-06	5.908E-06	5.908E-06
0	42	1.642E-05	1.642E-05	1.642E-05	1.642E-05	1.642E-05
0	44	4.378E-05	4.377E-05	4.377E-05	4.377E-05	4.377E-05
0	45	8.187E-05	8.187E-05	8.187E-05	8.187E-05	8.187E-05
0	46	1.198E-04	1.198E-04	1.198E-04	1.198E-04	1.199E-04
0	48	1.459E-04	1.459E-04	1.459E-04	1.459E-04	1.459E-04
0	50	1.525E-04	1.525E-04	1.525E-04	1.525E-04	1.525E-04

^{238}Pu

x [m]	y [m]	$M = 400$ $N = 2{,}000$	$M = 800$ $N = 4{,}000$	$M = 1{,}600$ $N = 8{,}000$	$M = 3{,}200$ $N = 16{,}000$	$M = 6{,}400$ $N = 32{,}000$	$M = 12{,}800$ $N = 64{,}000$
0	0	1.083E-09	2.720E-10	6.807E-11	1.702E-11	4.255E-12	1.064E-12
0	2	1.088E-09	2.731E-10	6.835E-11	1.709E-11	4.272E-12	1.068E-12
0	4	1.101E-09	2.765E-10	6.918E-11	1.730E-11	4.325E-12	1.081E-12
0	6	1.124E-09	2.822E-10	7.061E-11	1.766E-11	4.414E-12	1.103E-12
0	8	1.157E-09	2.904E-10	7.268E-11	1.817E-11	4.543E-12	1.136E-12
0	10	1.201E-09	3.015E-10	7.546E-11	1.887E-11	4.717E-12	1.179E-12
0	12	1.258E-09	3.159E-10	7.905E-11	1.977E-11	4.942E-12	1.235E-12
0	14	1.330E-09	3.341E-10	8.361E-11	2.091E-11	5.226E-12	1.307E-12
0	16	1.421E-09	3.569E-10	8.932E-11	2.233E-11	5.584E-12	1.396E-12
0	18	1.535E-09	3.855E-10	9.646E-11	2.412E-11	6.033E-12	1.511E-12
0	20	1.677E-09	4.212E-10	1.055E-10	2.641E-11	6.647E-12	1.706E-12
0	22	1.857E-09	4.670E-10	1.175E-10	2.998E-11	8.104E-12	2.634E-12
0	24	2.094E-09	5.328E-10	1.403E-10	4.207E-11	1.750E-11	1.136E-11
0	26	2.468E-09	6.867E-10	2.387E-10	1.266E-10	9.855E-11	9.154E-11
0	28	3.482E-09	1.410E-09	8.887E-10	7.583E-10	7.257E-10	7.175E-10
0	30	8.100E-09	5.635E-09	5.016E-09	4.860E-09	4.822E-09	4.812E-09
0	32	3.130E-08	2.829E-08	2.753E-08	2.734E-08	2.729E-08	2.728E-08
0	34	1.363E-07	1.324E-07	1.315E-07	1.312E-07	1.312E-07	1.312E-07
0	36	5.454E-07	5.403E-07	5.391E-07	5.387E-07	5.387E-07	5.386E-07
0	38	1.917E-06	1.910E-06	1.908E-06	1.907E-06	1.907E-06	1.907E-06
0	40	5.922E-06	5.911E-06	5.909E-06	5.908E-06	5.908E-06	5.908E-06
0	42	1.643E-05	1.642E-05	1.642E-05	1.642E-05	1.642E-05	1.642E-05
0	44	4.315E-05	4.375E-05	4.378E-05	4.377E-05	4.377E-05	4.377E-05
0	45	8.172E-05	8.185E-05	8.187E-05	8.187E-05	8.187E-05	8.187E-05
0	46	1.202E-04	1.198E-04	1.198E-04	1.198E-04	1.199E-04	1.199E-04
0	48	1.456E-04	1.459E-04	1.459E-04	1.459E-04	1.459E-04	1.459E-04
0	50	1.521E-04	1.524E-04	1.525E-04	1.525E-04	1.525E-04	1.525E-04

^{234}U

x [m]	y [m]	$M = 800$ $N = 64{,}000$	$M = 1{,}600$ $N = 64{,}000$	$M = 3{,}200$ $N = 64{,}000$	$M = 6{,}400$ $N = 64{,}000$	$M = 12{,}800$ $N = 64{,}000$
0	0	4.582E-08	2.293E-08	1.147E-08	5.734E-09	2.868E-09
0	2	4.600E-08	2.302E-08	1.151E-08	5.758E-09	2.880E-09
0	4	4.657E-08	2.331E-08	1.165E-08	5.828E-09	2.915E-09
0	6	4.753E-08	2.379E-08	1.190E-08	5.948E-09	2.976E-09
0	8	4.892E-08	2.448E-08	1.224E-08	6.122E-09	3.063E-09
0	10	5.079E-08	2.542E-08	1.271E-08	6.357E-09	3.180E-09
0	12	5.321E-08	2.663E-08	1.332E-08	6.659E-09	3.331E-09
0	14	5.627E-08	2.816E-08	1.408E-08	7.043E-09	3.523E-09
0	16	6.012E-08	3.009E-08	1.505E-08	7.524E-09	3.764E-09
0	18	6.492E-08	3.249E-08	1.625E-08	8.126E-09	4.065E-09
0	20	7.094E-08	3.551E-08	1.776E-08	8.880E-09	4.442E-09
0	22	7.854E-08	3.932E-08	1.968E-08	9.850E-09	4.939E-09
0	24	8.863E-08	4.459E-08	2.253E-08	1.150E-08	5.984E-09
0	26	1.084E-07	5.817E-08	3.299E-08	2.040E-08	1.410E-08
0	28	2.247E-07	1.662E-07	1.370E-07	1.223E-07	1.150E-07
0	30	1.347E-06	1.278E-06	1.243E-06	1.225E-06	1.217E-06
0	32	1.114E-05	1.106E-05	1.102E-05	1.100E-05	1.098E-05
0	34	8.089E-05	8.078E-05	8.073E-05	8.070E-05	8.069E-05
0	36	4.817E-04	4.815E-04	4.815E-04	4.814E-04	4.814E-04
0	38	2.348E-03	2.348E-03	2.348E-03	2.348E-03	2.348E-03
0	40	9.480E-03	9.480E-03	9.479E-03	9.479E-03	9.479E-03
0	42	3.248E-02	3.248E-02	3.248E-02	3.248E-02	3.248E-02
0	44	1.011E-01	1.012E-01	1.012E-01	1.012E-01	1.012E-01
0	45	2.024E-01	2.025E-01	2.025E-01	2.025E-01	2.025E-01
0	46	3.035E-01	3.035E-01	3.035E-01	3.035E-01	3.035E-01
0	48	3.704E-01	3.705E-01	3.705E-01	3.705E-01	3.705E-01
0	50	3.862E-01	3.864E-01	3.864E-01	3.864E-01	3.864E-01

^{234}U

x [m]	y [m]	M = 12,800 N =4,000	M = 12,800 N =8,000	M = 12,800 N =16,000	M = 12,800 N =32,000	M = 12,800 N =64,000
0	0	9.540E-08	4.633E-08	2.299E-08	1.147E-08	2.868E-09
0	2	9.579E-08	4.652E-08	2.308E-08	1.152E-08	2.880E-09
0	4	9.697E-08	4.709E-08	2.337E-08	1.166E-08	2.915E-09
0	6	9.897E-08	4.806E-08	2.385E-08	1.190E-08	2.976E-09
0	8	1.019E-07	4.947E-08	2.455E-08	1.225E-08	3.063E-09
0	10	1.058E-07	5.136E-08	2.549E-08	1.272E-08	3.180E-09
0	12	1.108E-07	5.380E-08	2.670E-08	1.333E-08	3.331E-09
0	14	1.172E-07	5.691E-08	2.824E-08	1.409E-08	3.523E-09
0	16	1.252E-07	6.079E-08	3.017E-08	1.506E-08	3.764E-09
0	18	1.352E-07	6.565E-08	3.258E-08	1.626E-08	4.065E-09
0	20	1.477E-07	7.174E-08	3.560E-08	1.777E-08	4.442E-09
0	22	1.635E-07	7.942E-08	3.943E-08	1.969E-08	4.939E-09
0	24	1.841E-07	8.962E-08	4.471E-08	2.254E-08	5.984E-09
0	26	2.174E-07	1.096E-07	5.830E-08	3.301E-08	1.410E-08
0	28	3.514E-07	2.260E-07	1.664E-07	1.370E-07	1.150E-07
0	30	1.498E-06	1.349E-06	1.278E-06	1.243E-06	1.217E-06
0	32	1.133E-05	1.115E-05	1.106E-05	1.102E-05	1.098E-05
0	34	8.112E-05	8.089E-05	8.078E-05	8.073E-05	8.069E-05
0	36	4.820E-04	4.817E-04	4.815E-04	4.815E-04	4.814E-04
0	38	2.349E-03	2.348E-03	2.348E-03	2.348E-03	2.348E-03
0	40	9.481E-03	9.480E-03	9.480E-03	9.479E-03	9.479E-03
0	42	3.248E-02	3.248E-02	3.248E-02	3.248E-02	3.248E-02
0	44	1.013E-01	1.013E-01	1.012E-01	1.012E-01	1.012E-01
0	45	2.025E-01	2.025E-01	2.025E-01	2.025E-01	2.025E-01
0	46	3.035E-01	3.035E-01	3.035E-01	3.035E-01	3.035E-01
0	48	3.705E-01	3.705E-01	3.705E-01	3.705E-01	3.705E-01
0	50	3.864E-01	3.864E-01	3.864E-01	3.864E-01	3.864E-01

^{234}U

x [m]	y [m]	$M=800$ $N=4{,}000$	$M=1{,}600$ $N=8{,}000$	$M=3{,}200$ $N=16{,}000$	$M=6{,}400$ $N=32{,}000$		
0	0	7.335E-07	1.836E-07	4.590E-08	1.147E-08	2.868E-09	7.171E-10
0	2	7.365E-07	1.843E-07	4.608E-08	1.152E-08	2.880E-09	7.200E-10
0	4	7.455E-07	1.866E-07	4.665E-08	1.166E-08	2.915E-09	7.288E-10
0	6	7.609E-07	1.904E-07	4.761E-08	1.190E-08	2.976E-09	7.439E-10
0	8	7.831E-07	1.960E-07	4.900E-08	1.225E-08	3.063E-09	7.656E-10
0	10	8.131E-07	2.035E-07	5.088E-08	1.272E-08	3.180E-09	7.949E-10
0	12	8.518E-07	2.132E-07	5.330E-08	1.333E-08	3.331E-09	8.328E-10
0	14	9.009E-07	2.254E-07	5.637E-08	1.409E-08	3.523E-09	8.808E-10
0	16	9.625E-07	2.409E-07	6.022E-08	1.506E-08	3.764E-09	9.410E-10
0	18	1.039E-06	2.601E-07	6.504E-08	1.626E-08	4.065E-09	1.016E-09
0	20	1.136E-06	2.842E-07	7.106E-08	1.777E-08	4.442E-09	1.111E-09
0	22	1.257E-06	3.146E-07	7.868E-08	1.969E-08	4.939E-09	1.252E-09
0	24	1.412E-06	3.537E-07	8.879E-08	2.254E-08	5.984E-09	1.844E-09
0	26	1.619E-06	4.110E-07	1.086E-07	3.301E-08	1.410E-08	9.378E-09
0	28	1.982E-06	5.766E-07	2.249E-07	1.370E-07	1.150E-07	1.095E-07
0	30	3.437E-06	1.766E-06	1.347E-06	1.243E-06	1.217E-06	1.210E-06
0	32	1.370E-05	1.166E-05	1.114E-05	1.102E-05	1.098E-05	1.098E-05
0	34	8.412E-05	8.154E-05	8.089E-05	8.073E-05	8.069E-05	8.068E-05
0	36	4.860E-04	4.825E-04	4.817E-04	4.815E-04	4.814E-04	4.814E-04
0	38	2.354E-03	2.349E-03	2.348E-03	2.348E-03	2.348E-03	2.348E-03
0	40	9.489E-03	9.482E-03	9.480E-03	9.479E-03	9.479E-03	9.479E-03
0	42	3.250E-02	3.249E-02	3.248E-02	3.248E-02	3.248E-02	3.248E-02
0	44	1.012E-01	1.013E-01	1.013E-01	1.012E-01	1.012E-01	1.012E-01
0	45	2.024E-01	2.025E-01	2.025E-01	2.025E-01	2.025E-01	2.025E-01
0	46	3.034E-01	3.035E-01	3.035E-01	3.035E-01	3.035E-01	3.035E-01
0	48	3.703E-01	3.705E-01	3.705E-01	3.705E-01	3.705E-01	3.705E-01
0	50	3.862E-01	3.863E-01	3.864E-01	3.864E-01	3.864E-01	3.864E-01

x [m]	y [m]	$M = 800$ $N = 4{,}000$				
0	0	6.622E-10	3.326E-10	1.664E-10	8.325E-11	4.164E-11
0	2	6.649E-10	3.339E-10	1.671E-10	8.358E-11	4.181E-11
0	4	6.730E-10	3.380E-10	1.692E-10	8.461E-11	4.232E-11
0	6	6.869E-10	3.450E-10	1.727E-10	8.635E-11	4.320E-11
0	8	7.070E-10	3.551E-10	1.777E-10	8.888E-11	4.446E-11
0	10	7.341E-10	3.687E-10	1.845E-10	9.228E-11	4.616E-11
0	12	7.690E-10	3.862E-10	1.933E-10	9.668E-11	4.836E-11
0	14	8.133E-10	4.085E-10	2.044E-10	1.022E-10	5.115E-11
0	16	8.689E-10	4.364E-10	2.184E-10	1.092E-10	5.464E-11
0	18	9.384E-10	4.713E-10	2.359E-10	1.180E-10	5.901E-11
0	20	1.025E-09	5.149E-10	2.577E-10	1.289E-10	6.448E-11
0	22	1.135E-09	5.700E-10	2.853E-10	1.427E-10	7.137E-11
0	24	1.274E-09	6.400E-10	3.203E-10	1.602E-10	8.017E-11
0	26	1.455E-09	7.311E-10	3.662E-10	1.835E-10	9.209E-11
0	28	1.702E-09	8.597E-10	4.353E-10	2.227E-10	1.164E-10
0	30	2.146E-09	1.144E-09	6.395E-10	3.866E-10	2.602E-10
0	32	3.929E-09	2.704E-09	2.087E-09	1.778E-09	1.624E-09
0	34	1.644E-08	1.489E-08	1.411E-08	1.372E-08	1.352E-08
0	36	1.043E-07	1.023E-07	1.013E-07	1.007E-07	1.005E-07
0	38	6.366E-07	6.337E-07	6.323E-07	6.316E-07	6.312E-07
0	40	3.429E-06	3.427E-06	3.424E-06	3.423E-06	3.423E-06
0	42	1.773E-05	1.783E-05	1.782E-05	1.782E-05	1.782E-05
0	44	1.028E-04	1.089E-04	1.093E-04	1.093E-04	1.093E-04
0	45	3.639E-04	3.636E-04	3.637E-04	3.637E-04	3.637E-04
0	46	6.249E-04	6.183E-04	6.180E-04	6.181E-04	6.181E-04
0	48	7.095E-04	7.089E-04	7.090E-04	7.090E-04	7.090E-04
0	50	7.210E-04	7.205E-04	7.206E-04	7.206E-04	7.206E-04