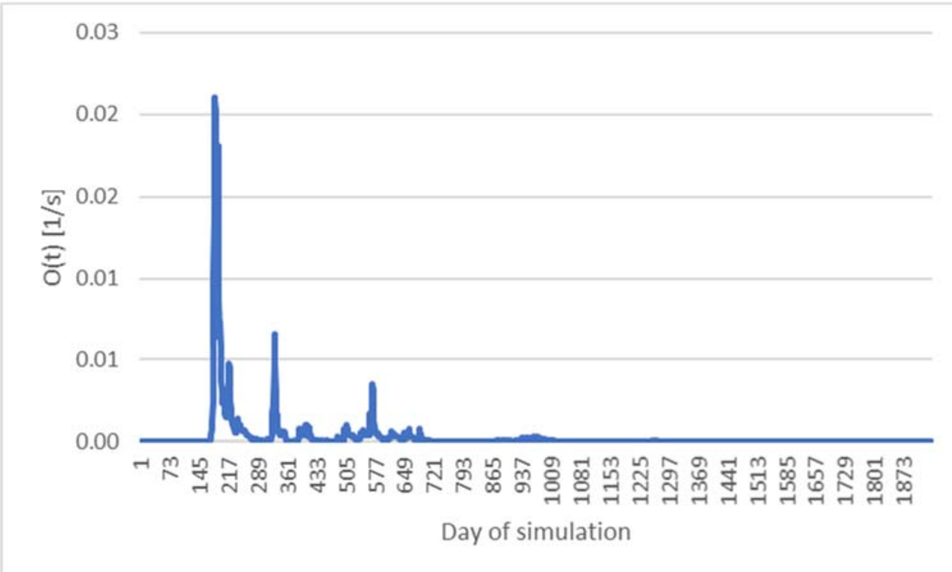
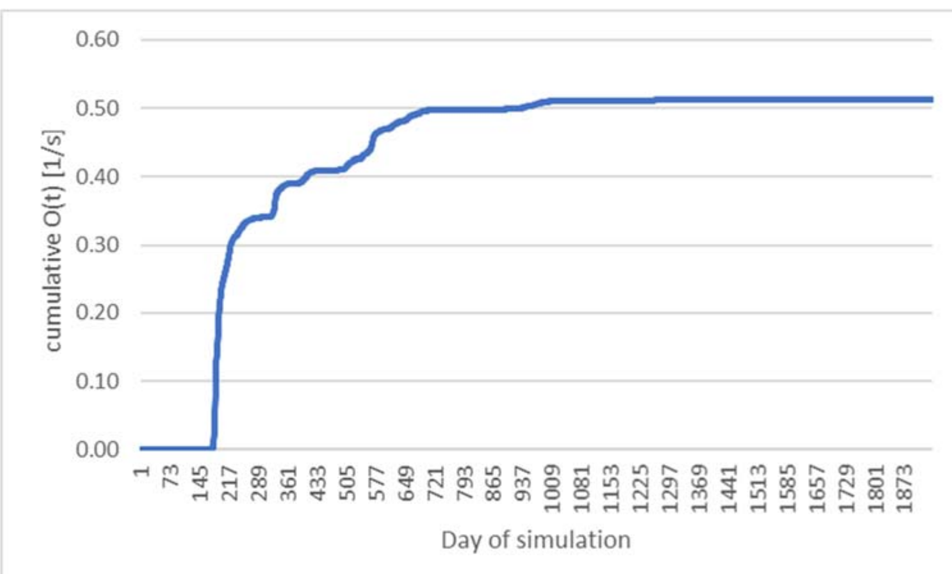
Calculation of mass flux normalized by the infiltrated mass O(t):

O(t) = [C(t) * Q(t)] / I(t=0)   Unit: [g/l * l/s / kg = 1/s]

With C(t) [g/l] is the concentration in the flux, Q(t) [l/s] is the flux, I(t=0) [kg]

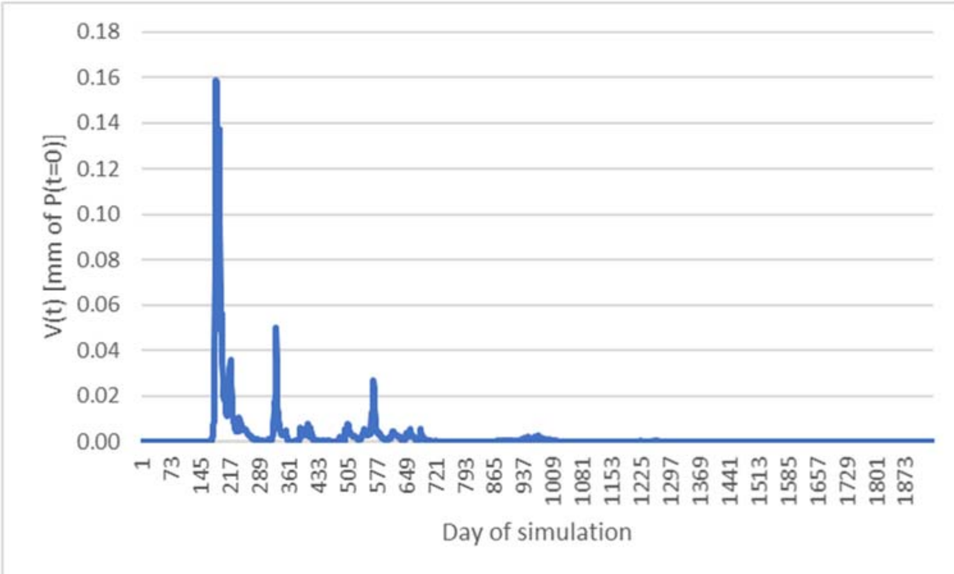


In the cumulative distribution of O(t), one can see in this example, that about 51% of the introduced tracer left the soil via this outflow (i.e.g, recharge). The median travel time was calculated as the median of the 51% in this case (i.e., at 20.5% here).



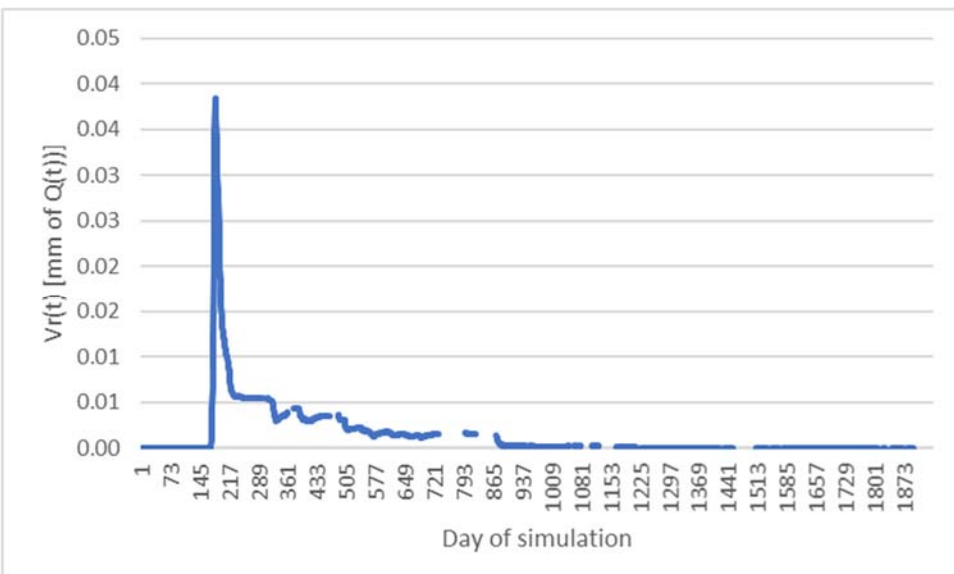
To get the amount V(t) [mm/s] of precipitation in the flux, multiply with the introduced volume, P(t=0):

V(t) = O(t) * P(t=0)   Unit: [mm/s]

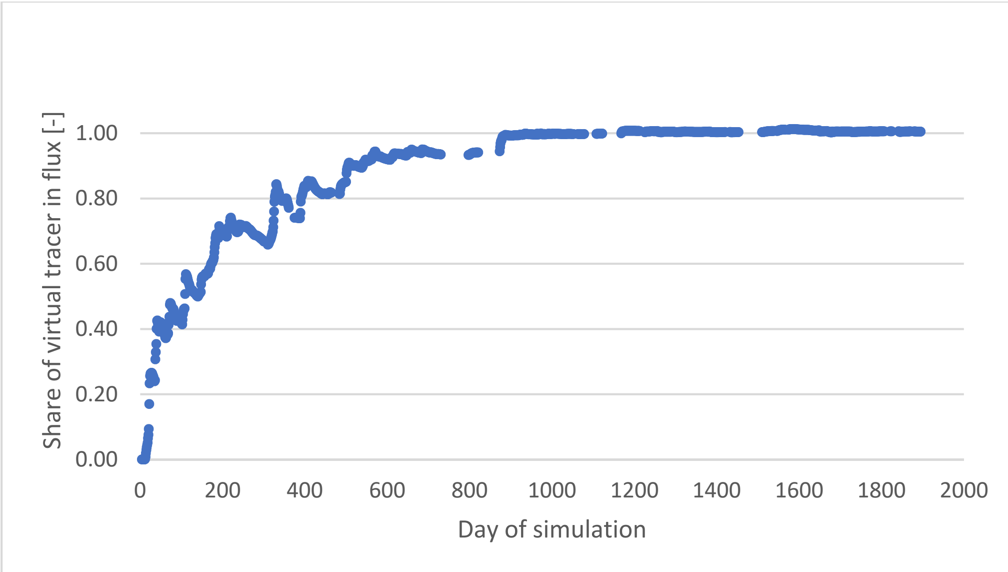


To get the share of this precipitation event of the total flux Vr(t), divide by the flux volume on the day of interest F(t) [mm]:

Vr(t) = V(t) / F(t)   Unit: 1 / day



When Vr(t) is summarized over all virtual tracers, one can see that all water in the flux is eventually composed of the virtual tracers: It approaches unity when all water, that was stored initially in the soil (of unknown age) has been recharged.



We can then add the share of water in the flux of different ages and get a cumulative age distribution. The median of that distribution (0.5 on y-axis) shows the day of infiltrated water of which half in the flux is older than that day and the other half in the flux is younger. The water age is then difference between this day and the day of interest in the flux.