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Interactive comment on "Quantifying new water fractions and transit time distributions using ensemble hydrograph separation: theory and benchmark tests" *by* J. Kirchner

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The discussion paper, "Quantifying new water fractions and transit time distributions using ensemble hydrograph separation: theory and benchmark tests," uses weighted regressions in several places (specifically Eqs. 16, 28, and 54). These calculations are based on a simple short-cut that is widely used in the physical sciences, namely that if one multiplies both the x_j's and y_j's by the square root of the weights w_j, an ordinary least-squares regression of the square-root-weighted x_j's and y_j's will yield an accurate estimate of the weighted regression slope.

However, this short-cut requires that the volume-weighted averages of the x_j's and

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Discussion paper

y_j's are both zero (or, as an approximation, almost zero). That condition is met in the calculations in the paper, but might not be met in other situations in which these equations could potentially be applied. To avoid any misunderstanding, the general equations for weighted regression (which do not require this approximation) will be presented in the final version of the paper.

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