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Modeling mixing in high heterogeneous media: the role of the water discretization for phase space formulation

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Modeling solute transport in porous media with high heterogeneity faces two challenges. First, the dispersion dependency with scale has to be reproduced. This is important because real application may have kilometric dimensions although some processes occur at pore scale. Second, a good representation of the mix process is of paramount importance because it leads to chemical reactions. Finding an equation that satisfies these conditions is needed. Although some methods (Correlated Continuous Time Random Walk, hybrid methods...) provide a partial response to these problems, no any proposed solution to date characterizes efficiently all parameters involved in reactive transport. In this contribution a new formulation to reproduce the solute evolution in heterogeneous media is proposed. The formulation is based on the Water Mixing Approach method and the velocity distribution is discretized as well as space and time. Therefore concentration is a variable in space, time and velocity. Promising results have been obtained from this assumption.