

A Diffusion Approximation for a Network of Reservoirs with Power Law Release Rule

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A diffusion approximation for a network of continuous time reservoirs with power law release rules is examined. Under a mild assumption on the inflow processes, we show that for physically reasonable values of the power law constants, the system of processes converges to a multi-dimensionM Gaussian diffusion process. We also illustrate how the limiting Gaussian process may be used to compute approximations to the original system of reservoirs. In addition, we study the quality of our approximations by comparing them to results obtained by simulations of the original watershed model. The simulations offer support for the use of the approximation developed here.