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Title: Second order well balanced numerical methods for a coupled system models the growth of a sand pile .

Abstract: We propose and analyse the second order finite volume Godunov type numerical methods for a 2×2 system of hyperbolic balance laws which models the growth of a sand pile, generated by vertical source on a flat bounded rectangular table. This model was proposed by Haderer and Kuttler and in such a system, an eikonal equation for the standing layer of the pile is coupled to an advection equation for the rolling layer. The scheme is made well-balanced by modifying the flux function locally by including source term as a part of the convection term. Slow attainment of the steady state in the second order scheme is controlled by switch to first order near the steady state. Numerical experiments are presented to illustrate the efficiency of the second order schemes for both open and partially open table problems by comparing them with the first order schemes. This is a joint work with Aekta Aggarwal and Sudarshan Kumar.