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A Numerical Study of Shear Flow in Partially Vegetated Open Channels JINGFANG QU, SUNY, Stony Brook, S CHEN, North Carolina State University, JIE YU, XIAOLIN LI, SUNY, Stony Brook — Shear flow at the interface between a porous layer and an open conduit is a problem of fundamental importance to problems ranging from natural to engineered flows. Such shear flows are known to be unstable, inducing waves and coherent vortices via Kelvin-Helmholtz instability. These coherent flow structures can strongly enhance the exchange of scalar variables and vector variable such as momentum in and out of the canopy, hence playing an important role in controlling environmental quality of these system. We developed a numerical model using finite difference method for flow in open channel occupied by a vegetation canopy. We apply the method to simulate the shear flow and compare with the experimental study by White and Nepf in 2007. Preliminary comparisons with the experimental data show good agreements.

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