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A CELL MODEL FOR HYDROLOGICAL-HYDRAULIC MODELING

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ABSTRACT

A hydrological-hydraulic quasi-2D multilayer simulation model is presented. It models the dominant hydrological processes involved in the rainfall-runoff transformation in rural and urban environments. The modeling structure is based on the well-known schemes of interconnected cells, with the original addition of a large set of linking laws. These allow flow simulation in both surface runoff and networks of closed conduits. The model was developed to embrace different scales of rural and urban storm drainage from streets to river basins, and to cover different levels of detail, from river basins with a resolution of 0.10 elements/km² to drainage micro basins with 600 elements/km². The conceptual model and a synthesis of several relevant applications are presented here. The results obtained were satisfactory, and show that the real process of rainfall-runoff transformation flowing in a single layer and in two interconnected layers (surface runoff and networks of closed conduits) can be successfully modeled.

Reference: Riccardi, G.; A Cell Model for Hydrological-Hydraulic Modeling, Journal of Environmental Hydrology, Vol. 8, Paper 15, November 2000.

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