Geophysical Research Abstracts
Vol. 12, EGU2010-5726, 2010
EGU General Assembly 2010

Reflections on hydrological multiphysics at different scales according to GEOtop, NewAGE, and beyond

Riccardo Rigon, Stefano Endrizzi, Emanuele Cordano, and Giuseppe Formetta
Università'di Trento, Ingegneria Civile ed Ambientale/ CUDAM, Trento, Italy (riccardo.rigon@ing.unitn.it)

GEOtop (www.geotop.org) is a fully distributed, grid-based, hydrological model which solves the water and energy budget at few tens of square meters in a continuos time and three-dimensional grid. NewAGE (www.jgrass.org) is a large scale model that returns prognosis variables for each hillslope and compresses the spatial information in a discretization based on the hillslope-channel network topology. It represents the effort to reduce the original system of partial differential equations to a dynamical system, where, according to the needs, heterogeneity in the hydrological system are damped, and only some emergent features are retained, to cope with continental scale hydrology.
The differences in the conceptual and practical implementation of two type of models will be enlighten. The different conceptualization of the same processes and their rational is discussed also in comparison with other analogous "standard" models.
Furthermore, new mathematical and numerical methods are envisioned to include subgrid variability directly in the mathematics of the models, and an example based on subsurface-surface water interaction will be presented.
Finally, aspects connected to the characterization of the models at different scales is discussed, in the attempt to frame the meaning of Galileian experiments in such a context.