Introduction of the 2nd Phase of the Integrated Hydrologic Model Intercomparison Project

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The 2nd Phase of the Integrated Hydrologic Model Intercomparison Project commenced in June 2013 with a workshop at Bonn University funded by the German Science Foundation and US National Science Foundation. Three test cases were defined and compared that are available online at www.hpsc-terrsys.de including a tilted v-catchment case; a case called superslab based on multiple slab-heterogeneities in the hydraulic conductivity along a hillslope; and the Borden site case, based on a published field experiment. The goal of this phase is to further interrogate the coupling of surface-subsurface flow implemented in various integrated hydrologic models; and to understand and quantify the impact of differences in the conceptual and technical implementations on the simulation results, which may constitute an additional source of uncertainty. The focus has been broadened considerably including e.g. saturated and unsaturated subsurface storages, saturated surface area, ponded surface storage in addition to discharge, and pressure/saturation profiles and cross-sections. Here, first results are presented and discussed demonstrating the conceptual and technical challenges in implementing essentially the same governing equations describing highly non-linear moisture redistribution processes and surface-groundwater interactions.