

A combined water and energy flux observation and modelling study at the TERENO-preAlpine observatory

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Abstract Water and energy fluxes at and between the land surface/subsurface and the atmosphere are inextricably intertwined. In recent years, detailed observations of both water and energy fluxes in medium sized catchments became possible via new hydro-meteorological observatories like TERENO. This supports and enables the further development and evaluation of fully physically-based hydrological model systems that do not parameterize or even neglect specific parts of the energy balance and fluxes. We present results of a high resolution distributed modelling study based on the GEOtop model. It is applied to simulate both the water and energy balance and fluxes in the preAlpine environment of a medium size catchment in Bavaria, southern Germany, surrounding the TERENO-preAlpine test site, *Fendt*. Our simulations have a spatial resolution of 90 m and an hourly temporal resolution. We intercompare simulation results with observed streamflow measurements and energy flux observations obtained at an eddy-covariance tower.

Key words water flux, energy flux; eddy-covariance measurements; high-resolution hydrological modelling; preAlpine terrain; TERENO