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# Impact of enhanced hydrological processes on land-atmosphere feedbacks for the Attert catchment in Luxembourg – LES runs with WRF-Hydro-NOAH-MP vs. WRF-NOAH-MP

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Surface water and energy balance over intermediate catchments play a crucial role in convective processes such as turbulence characteristics, which is controlled by soil-vegetation-atmosphere (SVA) feedback mechanisms. However, the impact of model coupling strength on SVA is till unclear. Furthermore, simulations are ofter conducted at scales of 2 – 4 km, where turbulence is necessarily parameterized. It is therefore not known how significant enhanced hydrological processes impact on simulated water and energy balance and convective processes at LES scales which incorporate explicitly resolved turbulence and a detailed land surface representation. In this study, we perform 2 days simulations, including 1 day spin-up time, at a 100 m resolution with the hydrologically enhanced, fully coupled WRF-Hydro-NOAH-MP model for the Attert catchment in Luxembourg. The hydrological cycle components such as surface water and energy budget terms from this fully coupled model are compared with these from the standard WRF-NOAH-MP model. Both model results are validated with surface energy balance observations. Such comparison and investigation of feedback strength on the regional hydrological cycle has profound implications for process understanding.