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Convective Initiation using Diabatic Local Analysis and Prediction System and Weather Research Forecasting Model

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To test influence of diabatic Local Analysis and Prediction System initialization influence on simulation of convective initiation and development analysis and model simulations of two International H2O Project (IHOP) events have been performed. The selected events occurred on June the 13th and June the 16th of 2002. The June 13th event was associated with a stationary/cold frontal boundary and characterized by elevated convection. At the simulation initial time, 00 UTC, multiple convective cells existed in the vicinity of Oklahoma northern border. These convective cells pretty quickly organized into a squall line that moved north-west to south-east over the state of Oklahoma. June 16th 2002 event was also initialized at 00 UTC. At the initial time the event was characterized by well defined mesoscale convective system (MCS) in southern KS and northern OK. The MCS developed from the merger of three smaller systems couple of hours earlier.

Simulations of the two events were performed over six and three hours, respectively. During these periods both events were characterized with notable convective activity. The simulations were performed by using high spatial (2-km horizontal grid spacing and 53 vertical levels) and temporal (15-minute) resolutions. Also the simulations included use of three different microphysics schemes available in the WRF-ARW code. The three microphysics included Lin, WSM6 and Schultz. The model output was post processed by using two choices for synthetic reflectivity calculations. Results related to the influence of diabatic initialization as well as impact of various microphysics will be discussed at the conference.