Elevated Convection Initiation on 24 June 2015 during PECAN: A Case Study

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INTRODUCTION
The development of convective storms after dark has long represented a challenge for forecasting as well as research. This is partly due to elevated convection, the Plains Elevated Convection at Night (PECAN). This poster shows some observations and model analysis of a case of elevated convection initiation on 24 June 2015 that was sampled during PECAN.

DATA AND METHODS CONTINUED
The grid dimensions were 700 x 600, totaling 1400 km x 1200 km. No cumulus parameterization was used. Thompson microphysics, MYJ boundary-layer physics, and the Noah LSM were used for other parameterizations.

RESULTS
Convection initiated around 0500 UTC from preexisting altocumulus castellanus clouds (ACC) over eastern NE/western IA, shown in Fig. 3. The slope of the warm front was calculated to provide information about the frontal structure and ascent. The average slope ranged from 1.18 at 0300 UTC to 1.32 at 0600 UTC, as depicted in Fig. 4. The frontal slope in the WRF simulation ranged from 1.13 at 0300 UTC to 1.22 at 0600 UTC. After sunset the vertical gradient in temperature and mixing ratio also appeared to increase in a thin layer.

Vertical velocities on the frontal surface were calculated to show regions of ascent relative to where the convection initiated. Kinematic vertical velocities were calculated using the technique of Davies-Jones (1993) and by vertically integrating the continuity equation. The surface and tropopause were assigned vertical velocities of zero to preserve mass continuity (Fankhauser 1969; O'Brien 1970). The second technique to resolve vertical velocities used the vertical velocity equation in isentropic coordinates. Maximum kinematic vertical velocities were -12 μb/s at 0300 UTC near 800 hPa, while maximum isentropic vertical velocities were -10 μb/s at 0300 UTC. WRF kinematic vertical velocities are shown in Fig. 6.

REFERENCES


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