



Atmospheric Bores and Nocturnal Convection: Insights from the IHOP_2002 field project data and a simulated MCS

Kevin Haghi, Ben Blake, and Dr. David Parsons

*Presented by Kevin Haghi
University of Oklahoma
Norman, OK*

The behavior of bores in the nocturnal environment is not well understood and their contribution to nocturnal convection is understudied. This study investigates the frequency, structure and evolution of bores over the Great Plains primarily utilizing data from the IHOP_2002 project in order to better understand the presence of bores in the nocturnal environment and examine the role of bores in the initiation and maintenance of nocturnal convection. We examined radar fine-lines supplemented with surface data to track various properties of gust fronts and subsequent bores. Our data indicates that gust fronts frequently trigger bores more often than not. We also examined environmental soundings to calculate the stability and vertical wind profile of the nocturnal environment. Using a statistical model on fundamental hydraulic parameters, our results suggest that it is typical for a gust front to prevent the passage of stable air creating favorable conditions for bore development.

During IHOP_2002, the MAPR spaced antenna displayed vertical layer lifting by atmospheric bores on the order of a kilometer. A complimentary WRF-ARW simulation of a June 3–4, 2013 MCS over Oklahoma analyzed the Scorer parameter and revealed that less-than-perfect wave trapping is associated with active nocturnal convection in an MCS. We hypothesize that bores can interact favorably with the nocturnal environment to provide deep and appreciable vertical lifting, lifting that is sufficient for convective initiation and maintenance of thunderstorms. Future investigations will examine the profile of the environmental vertical wavenumber to quantify the vertical motions observed and/or simulated in a bore.

*This seminar will be webcast live at:
<http://www.fin.ucar.edu/it/mms/fl-live.htm>*

*Recorded seminar link can be viewed here:
<https://www.mmm.ucar.edu/events/seminars>*

Thursday, 04 February 2016, 3:30 PM
Refreshments 3:15 PM
NCAR-Foothills Laboratory
3450 Mitchell Lane
Bldg 2 Main Auditorium, Room 1022