The second Meteor Crater Experiment (METCRAX II) - An overview of the October 2013 field study

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ABSTRACT

The Second Meteor Crater Experiment (METCRAX II) was designed to study downslope-windstorm-type flows (DWF) that occur above the south and west inner sidewalls of the 1.2 km diameter Barringer Meteorite Crater in Arizona. These DWFs occur intermittently within the crater basin on clear, undisturbed nights in connection with a mesoscale drainage flow that approaches the crater from higher terrain to the southwest of the crater. During DWF events a wave descends in the lee of the upwind crater rim, producing strong and turbulent downslope flow above the slope, which rebounds in a hydraulic jump-like flow feature at the base of the slope. Multiple break-ins of these flows occur on suitable nights, and the individual break-ins vary in strength and duration.

This presentation will provide an overview of the October 2013 METCRAX II field experiment. This experiment was supported by the National Center for Atmospheric Research's Earth Observing Laboratory and by other organizations, with an extensive complement of field equipment including a radar wind profiler, 2 radio acoustic sounding systems, three scanning Doppler LiDARs, a vertically pointing LiDAR, instrumented 40- and 50-m towers, 3 surface flux stations, 3 SoDARs, a scintillometer, a ceilometer, automatic weather stations, an array of temperature data loggers, multiple pressure sensors, and visual and thermal IR time-lapse cameras. Seven overnight Intensive Observational Periods (IOPs) were selected during the month on the basis of weather forecasts. Three continuously operated tethersondes and 3-hourly radiosondes provided supplementary vertical sounding data during the IOPs. The forecasts were successful in selecting nights when the DWF phenomenon occurred, and analyses of the data are now underway. This presentation will summarize first results, with detailed analyses presented in other related presentations at the conference.