Flow Interactions Observed by a Very High-Resolution Surface Weather Station Network in Complex Terrain

Matt Jeglum, Sebastian Hoch, C. David Whiteman
University of Utah, USA

Frank W. Gallagher
US Army Dugway Proving Ground, Dugway, Utah, USA
Terrain at Dugway

- Playa
- Granite Mountain
- Camel Back
- Cedar Mountains
- Dugway Range
- Hydrologic Divide
- Gap SODAR
- LiDAR
- HOBO Temperature Sensor Line

(Inset map of the United States with a red marker at Dugway location.)
Synoptic Weather Situation

700 mb Wind Barbs
Solid lines: 500 mb height
Color shade: 700 mb Temp
East Slope Granite Mountain LiDAR
Gap SODAR during frontal passage

![Graph showing wind speed and direction over time and height](image)
Conclusions and Future Work

• High resolution surface data allows a novel examination of a real-world front interacting with topography.
  – The cold front goes both over and around Granite Mountain.
  – The “horseshoe” topography channels and turns the post-frontal wind, creating complex flows.

• Future work will involve additional cases, comparing phenomena with stability parameters, and model comparison/verification.