First Coordinated AMTM and Fe lidar Measurements at McMurdo, Antarctica

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Fe Lidar and AMTM at Arrival Height, McMurdo, Antarctica

- The University of Colorado Fe Boltzmann temperature lidar (Chu et al., 2002; Wang et al., 2012) was deployed at McMurdo station in 2010.
- Temperature and Fe density profiles from 75-115 km for every 15 min with 0.5 km vertical resolution. Lidar run on campaign bases.
- In this study, we utilize 7 nights of Fe lidar data from 2017 winter season:
  - April 22-23, May 13,18, Aug. 1-3
- 2017 is the first winter season for the USU AMTM measurements at McMurdo station
- AMTM continuous zenith temperature measurements with temporal resolution of ~30 seconds.
April 22-23, 2017
May 13 & 18, 2017

Fe Temperatures on 13 MY 2017 (UT)

Fe Temperatures on 18 MY 2017 (UT)
Fe lidar & AMTM: May 18, 2017
Fe Layer vs OH Layer: May 18, 2017

Not all dynamic driven!
Three day campaign: August 1-3, 2017
AMTM and Height Weighted lidar Temperature: Aug.1-3, 2017
OH peak altitude Aug 1-3, 2017
ALOMAR, 19.01. 11:30 - 20.01. 12:13, 2015

19-20 Jan, 2015, Fe lidar data

Jan 19-20, 2015
Summary

• This is our first coordinated measurement year at McMurdo station
• Both the lidar and AMTM temperature showed variability and wave activities during the night.
• By first look, the two temperature compares well, the difference could be caused by the layer height changes of OH
• More comparison with Fe lidar to obtain the information about OH layer altitudes at high latitudes, both north and south.