

Planned upgrades for the ARM HSRLs, and Raman Lidar engineering update

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Update on ARM Raman Lidars and Mentors



Mentorship:

- April 2019 - changes in mentorship roles:
 - John Goldsmith > associate mentor (20+ years as engineering mentor!)
 - Ray Bambha > lead mentor(HSRL) engineering mentor (RL)

Raman Lidars:

- Present - normal operations at all sites
 - Oliktok Raman Lidar restored for Summer 2019, resumed data collection June 7
- After MOSAiC - (tentative) Oliktok Raman Lidar may move to Utqiagvik (Barrow)



Planned upgrades for the ARM NSA HSRL

Current NSA HSRL:

Transmit 532 nm (only), narrow field of view (45 microrad.) , fixed orientation

Upgrades

- **Improvements to the maintainability and robustness**

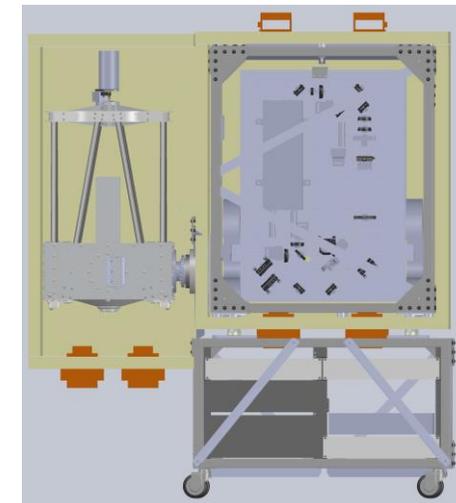
- Update instrument operating system and software
- Replace discrete photon-counting and clock PCI boards (4X) with single 16-channel board (custom)
- Enhanced alignment methods and interlocks

- **Performance upgrades**

- Increase cross-polarization signal (6X) and alignment stability
- Reduce range dependence of calibration using fiber-based beam homogenizer
- Increase calibration signal and frequency using direct injection of seed laser
- Improve calibration stability by adding etalon isolation valve

- **New capability**

- Improve accuracy of low altitude (<4Km) extinction cross-section using 532 nm wide-FOV molecular channel, and (tentative) wide-FOV combined molecular+aerosol channel.
- Obtain wavelength-dependent information for backscatter by adding 1064 nm narrow-FOV channels
- (tentative) Obtain particle orientation information by adding elevation scanning near zenith



Timeline of activities for HSRLs

NSA HSRL upgrade:

- Nov 2018, Feb 2019 Design reviews for upgrades
- Current Normal operations at NSA
- mid-July 2019 HSRL offline, shipping to Madison, WI for upgrades
- Late summer 2019 Shelter modifications at NSA
- Late-Jan 2020 Upgrades complete, ship to SGP for testing/operation
- Summer 2020 HSRL returns to NSA (Utqiagvik)

AMF2 HSRL deployment:

- February 2019 - maintenance/mechanical upgrades at U.Wisconsin in preparation for MOSAiC
- Present - Shipping to Norway for MOSAiC

NSA HSRL upgrade will provide new retrieval opportunities. For more details visit our poster on Tuesday...

