



Clean Air

## A Lidar's Achilles Heel??

February 2019

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Confidential: Commercial in Confidence

# How does a Lidar work?

All Lidars follow the same basic principle  
(with apologies to the R&D team!)

- Fire a laser beam into the sky
- Collect the light that bounces back
- Calculate the change in wavelength
- Add some signal processing magic
- Output a wind measurement

**Simple!**

The logo for ZephIR 300, featuring the word 'ZephIR' in a black, sans-serif font with a stylized orange 'Z' and 'R', followed by the number '300' in a smaller, black, sans-serif font.



The Far North should be a Lidar's holiday from hell...



# The CW Advantage

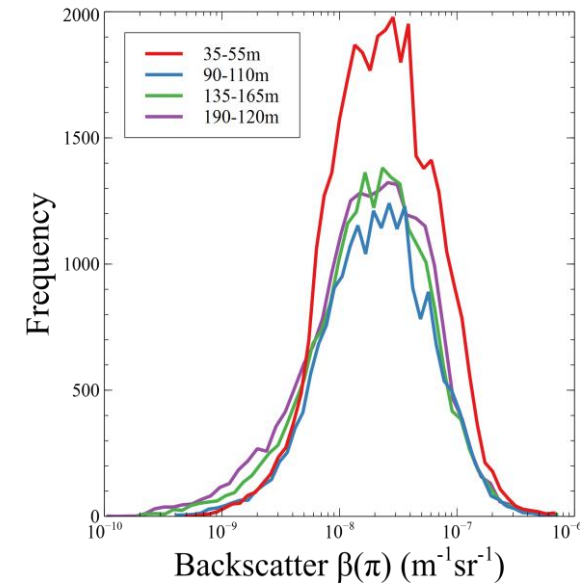
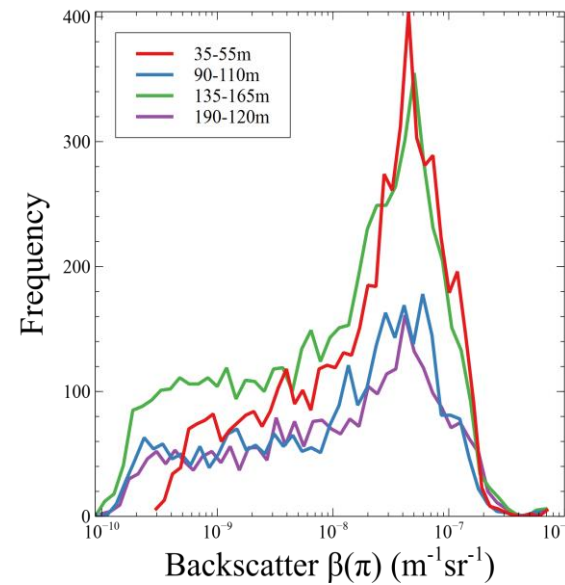
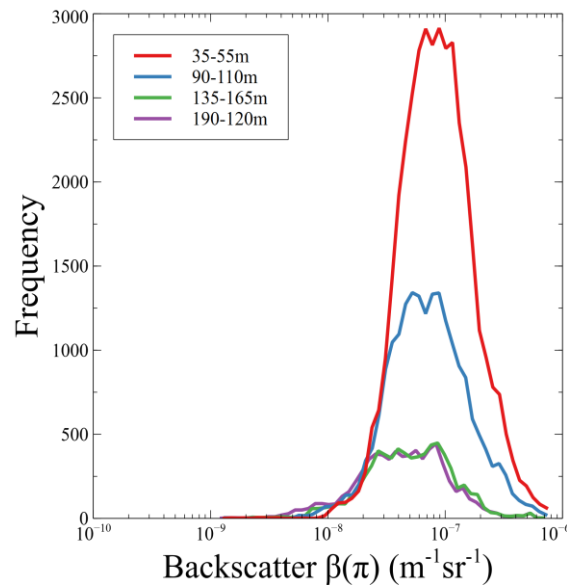
- **Constantly moving beam**
  - higher powered laser
- **Focused laser beam**
  - constant sensitivity with height
- **50hz scan rate**
  - redundancy in the unprocessed data
- **10m minimum measurement height**
  - can be extrapolated if all else fails
- **Robust measurements**
  - high system availability
- **And as of ZX300, true 1-second processing**
  - maximum data retention





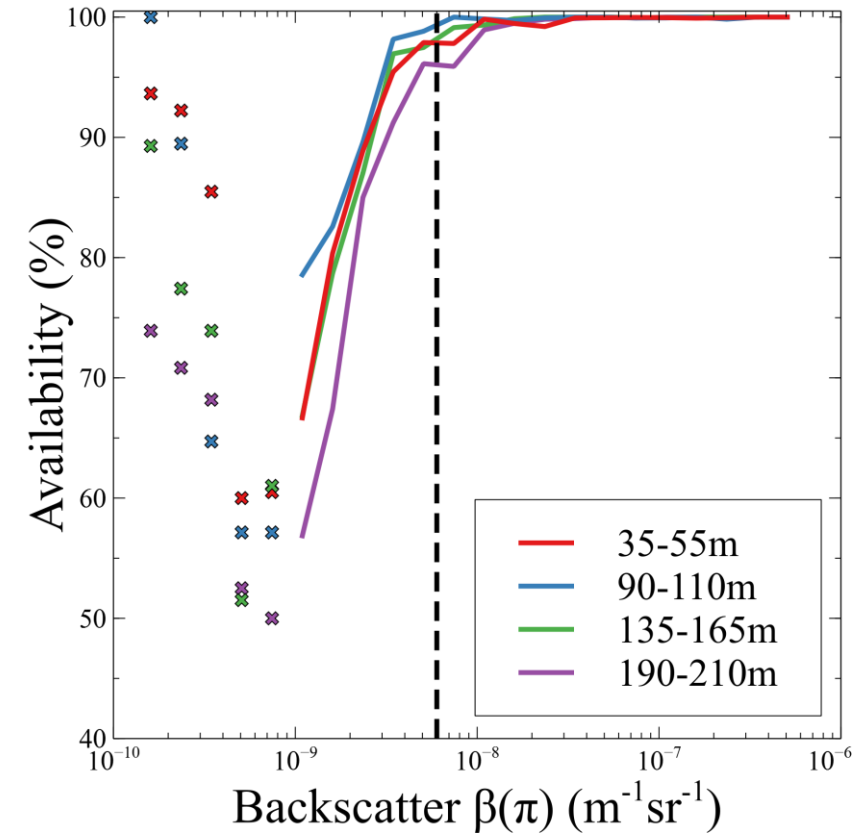
# The Test

- Three of the cleanest sites we have ever measured on
  - Offshore – North America, Atlantic Coast
  - Swiss Alps (altitude 1240m)
  - Finland (63° N)
- All deployments showed good availability, but were carried out with the previous Z300 Model. How would our latest ZX300 compare?



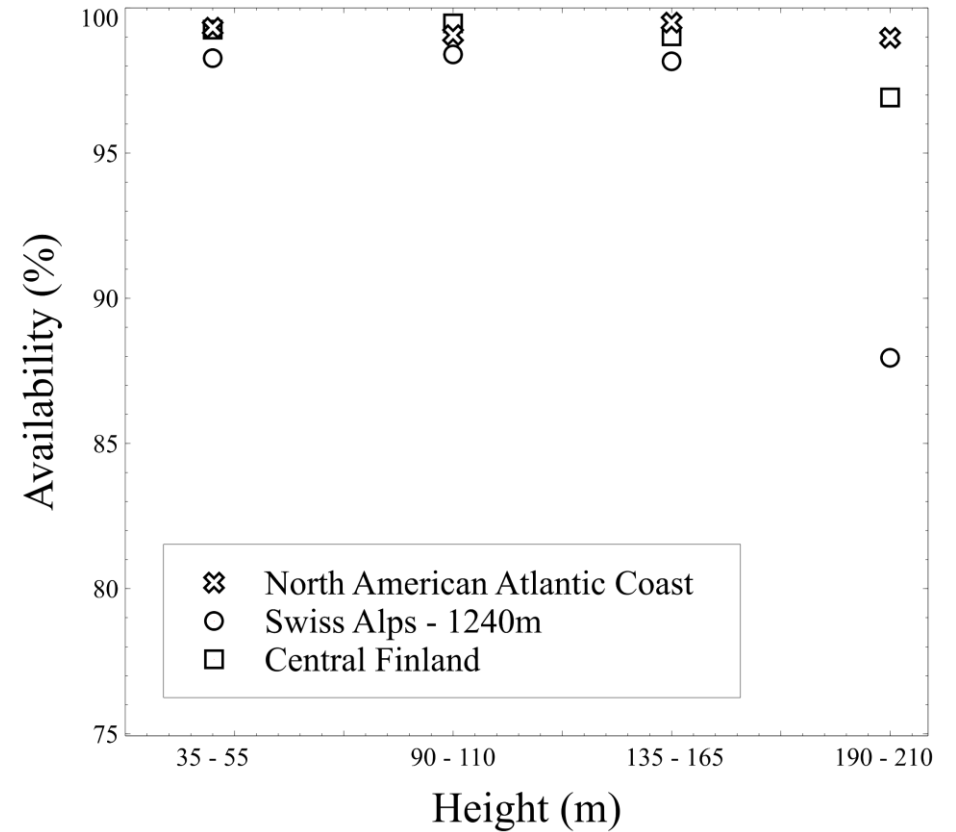
# Simulated Availability

- More than 300 deployments at the ZX Lidars Test Site were reprocessed using ZX300 algorithms
- Average performance as a function of backscatter was plotted
- This provides a “simulation” of clean air effects which can be applied to the real world data sets



# The Results

- Simulated campaign availability exceeds 85% at all heights, even in the most challenging conditions
- 95% availability exceeded at all heights up to 165m, across all campaigns



# A (CW) Lidar in clean air? Why not...

- Real world availability rarely seen below 90%
- Rugged, practical design gives reliability and long service life
- DNV GL Stage 3 and IEC Classified Data
- Full Data-as-a-Service provision through ZX Measurement Services
- **And let's face it, masts in cold weather are nobody's idea of fun!**



Boralex - Port Ryerse Wind Farm Ontario, Canada, 2018





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