

Baron, P., S. Ishii, K. Okamoto, K. Gamo, K. Mizutani, C. Takahashi, T. Itabe, T. Iwasaki, T. Kubota, T. Maki, R. Oki, S. Ochiai, D. Sakaizawa, M. Satoh, Y. Satoh, T. Y. Tanaka, and M. Yasui, 2017: Feasibility study for future spaceborne coherent Doppler Wind Lidar. Part 2: Measurement simulation algorithms and retrieval error characterization. *J. Meteor. Soc. Japan*, **95**, 319-342.

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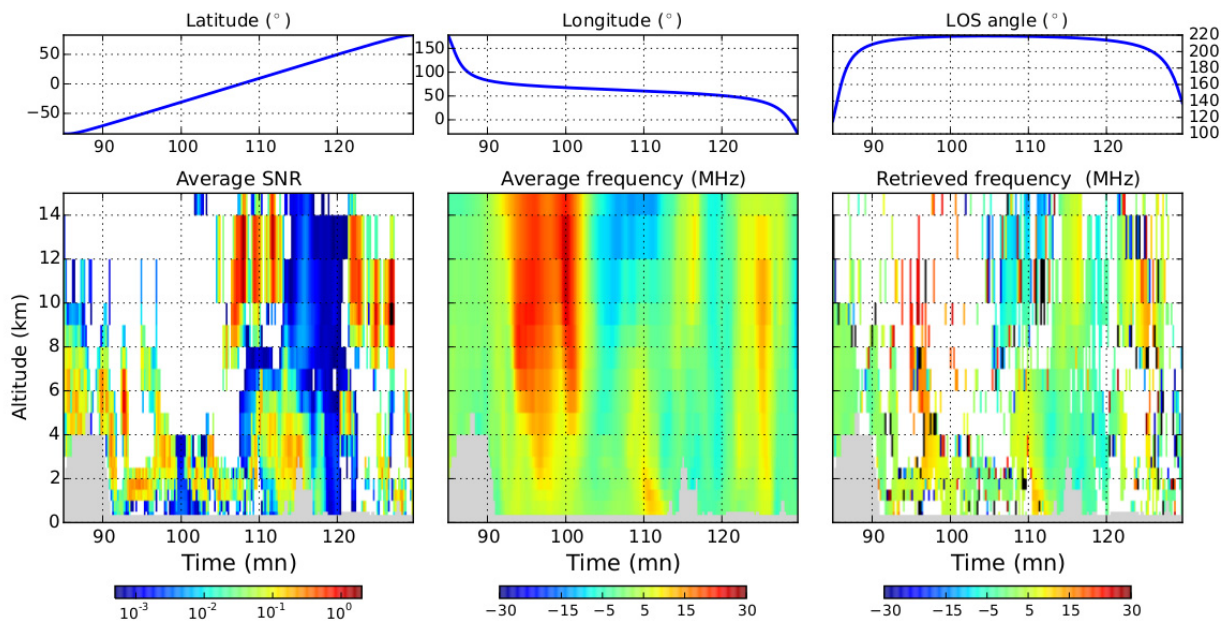


Figure 1. The two first main panels show the Signal-to-Noise Ratio (SNR) and wind induced Doppler shift frequencies averaged over the observed atmospheric ranges. The last main panel shows the measured Doppler shift frequencies. Data are shown over half a polar orbit (upper panels).

- A feasibility study of tropospheric wind measurements using a coherent Doppler lidar (wavelength of $2.05 \mu\text{m}$) aboard a super low altitude satellite is being conducted in Japan.
- We describe a simulator of the measurements and use a summertime month of observations from a polar orbit to characterize the LOS wind retrieval errors and assess the instrument performance.
- 3-d and global cloud and wind fields are the pseudo-truth of an Observing System Simulation Experiment while aerosol data are from the aerosol model MASINGAR constrained with the pseudo-truth wind.
- Below 8 km, the ratio of good retrievals is 30%--55% and the median LOS wind error is better than 0.6 m s^{-1} .
- In the upper troposphere, the ratio is less than 15% in the southern hemisphere and high-latitudes. However, the ratio is still about 35% in the northern Tropics and mid-latitudes where ice-clouds frequently occur. The upper-tropospheric median measurement error is between $1\text{-}2 \text{ m s}^{-1}$.