

IMPLEMENTING A DOPPLER WIND LIDAR ON NPOESS USING ADAPTIVE TARGETING STRATEGIES

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Abstract

One of the next remote sensing frontiers is the use of lasers (e.g. Doppler wind lidars , DIAL, aerosol and cloud lidars) in space to actively measure winds, gases and optically detectable parameters. In particular, the lack of direct wind profile observations over the oceans, southern hemispheric continents and in the tropics represents a major impediment to advancing our knowledge of the global atmospheric transport and dynamics. Doppler wind lidars with sufficient energy to provide full, accurate tropospheric soundings from orbits of 800 to 850 km will require significant platform resources (power, thermal control, data management). If such an instrument is to fly on NPOESS or any other integrated observing system in the near future, some means to reduce the orbit averaged power demand is needed. There is growing evidence through modeling and field studies that most of the impact of observations such as wind profiles can be realized by targeting just a fraction of the atmosphere. The use of adaptive or selective targeting with a space-based wind lidar will be discussed along with suggested strategies for selecting the optimal targets.