

Ground-based simulation of a space- based Doppler lidar atmospheric wind sounder

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Abstract

The current concept of a space-based Doppler lidar atmospheric wind sounder is a pulsed (8-Hz) coherent CO₂ laser with a conical scanner (36°/s), which obtains line-of-sight (LOS) measurements of the winds within cylindrical sample volumes ($r = 10$ m, $l = 500$ m) spaced at ~120-km intervals. To estimate the horizontal wind vectors, these LOS data are then combined using algorithms based on simplified or idealized models of the real wind field and its spatial and temporal variations.