

Adaptive Airborne Doppler Wind Lidar Beam Scanning Patterns for Complex Terrain and Small Scale
Organized Atmospheric Structure Observations

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Abstract

The conical scan is the traditional pattern used to obtain vertical profiles of the wind field with an airborne Doppler wind lidar. Nadir or zenith pointing scanning wedges are ideal for this type of scan. A bi-axis scanner has been operated on a Navy Twin Otter for more than 6 years and has been recently installed on a Navy P3 for use in a field experiment to study typhoons. The bi-axis scanner enables a broad range of scanning patterns. A subset of the possible patterns is critical to obtaining useful wind profiles in the presence of complex terrain or small (~ 100 's of meters) organized atmospheric structures (rolls, updrafts, waves, etc). Several scanning strategies have been tested in flights over the Monterey Peninsula and within tropical cyclones. Combined with Google Earth (on-board) and satellite imagery overlays, new real time adaptive scanning algorithms are being developed and tested. The results of these tests (both real and simulated) will be presented in the form of case studies.

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