Review of Fundamental Characteristics of Coherent and Direct Detection Doppler Receivers and Implications to Wind Lidar System Design. Sammy W. Henderson, Beyond Photonics (USA).

ABSTRACT

Coherent and direct detection lidar systems for wind measurement applications have many similarities but differ fundamentally in photon detection and frequency estimation sensitivity. In this paper we review the key characteristics of each receiver type and implications of these fundamental characteristics on the design of Doppler measurement lidar systems. Although signals from aerosol and molecular scattering are included in the discussion, the emphasis in this paper is on systems utilizing narrowband aerosol backscatter for the wind measurement.