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Simulated detection and inversion of multi-species in atmosphere with a supercontinuum LIDAR

Proc. SPIE, Vol. 7382, 73820E (2009); doi:10.1117/12.837138

Online Publication Date: 28 August 2009

Conference Date: Wednesday 17 June 2009
 Conference Location: Beijing, China
 Conference Title: International Symposium on Photoelectronic Detection and Imaging 2009: Laser Sensing and Imaging
 Conference Chairs: Farzin Amzajerjian, Chun-qing Gao, Tian-yu Xie

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ABSTRACT

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The large band-width of super continuum Laser permits long path examination of large continual spectral regions to measure multi-species present simultaneously along the path. Herein statistical calculation and inversion with MLE on base of multivariate normal distribution model given focus on testing engineering capability of simultaneous multi-species detection with MODTRAN4 return under different cases of widely varied noise and atmospheric aerosol extinction. Simulation on available waveband of commercial super continuum Laser produce perfect results that agree with true concentration of multi-species and show complete approach advantages of abundant wavelength lines selected with a super continuum LIDAR: high accuracy, low FAR and robust result.

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DOI Link: <http://dx.doi.org/10.1117/12.837138>

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