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Optical Effects in Simultaneously Transmitting Laser Radar Systems S. JAKE ATKINS, NIMMI SHARMA, Central Connecticut State University — Laser Radar is a valuable tool for studying Earth's atmosphere. Much research is done using monostatic systems, such as the Micro-Pulse Lidar (MPL) System, where the laser source and the detector of the laser light scattered by air molecules and atmospheric particulates are at the same location. The CCD Camera Lidar System (CLidar) is a bistatic arrangement in which the detector is separated from the laser, yielding enhanced altitude resolution near the ground. Central Connecticut State University possesses both a MPL and a CLidar system. To use both systems simultaneously, it must be determined if there is any optical overlap in the measurements. The MPL system uses a 527 nm laser while the CLidar system uses a 532 nm laser. The MPL's narrow band filtration excludes the CLidar laser wavelength from the MPL data, however the CLidar's wide angle optical collection system does not permit a narrow band interference filter. Thus, when both systems run together, light scattered from the MPL laser may potentially be collected in the CLidar data. To investigate this possibility, a three minute exposure on the CLidar's CCD detector is taken with both lasers transmitting, after which the shutter is closed on the MPL laser and another three minute exposure is taken with just the CLidar laser beam in view. This is repeated for five additional trials, and then a statistical analysis is performed on the results.

Nimmi Sharma
Central Connecticut State University

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