Perspectives on the Future of Coherent Laser Radar. Paul McManamon, Exciting Technology (USA)

ABSTRACT

Dr McManamon will give his perspective on the future for coherent ladar. He will briefly review the main benefits of coherent ladar compared to direct detection, and other sensing modalities. He will then briefly re-cap some of the history of coherent ladar. After this re-cap he will address what laser sources he expects will become prevalent for future coherent ladars, what wavelengths will they operate at, what mission(s) future coherent ladars will use, what benefits of coherent ladar will drive its use, what waveforms will be used, and what type of optics will be used? Some of the main benefits of coherent ladars are; You can use poor detectors because a strong LO hides noise, you can directly measurement of velocity because of the Doppler shift, you can directly measure the return field instead of just the strength of the return signal, it is easy to use a high duty cycle waveform, which makes it easy to build efficient laser sources for coherent ladars. The reasons for using coherent ladars have varied over time. It is anticipated one of the main drivers for future use of coherent ladar will be its ability to measure field. This will allow ladars using multiple sub-apertures for both transmit and receive, a concept called multiple input, multiple ouput, MIMO, sensing. MIMO sensors have been developed for radar. It is anticipated the future for coherent ladar will also include MIMO based sensing.