Adaptative compensation on free-space optical coherent systems. Esdras Anzuola and Aniceto Belmonte, UPC BarcelonaTech (Spain) .

ABSTRACT

New, affordable adaptive compensation methods and technologies can help to improve substantially the performance and reliability of coherent optical systems in the atmosphere. The use of adaptive optics to mitigate turbulence-induced phase fluctuations in receivers employing coherent detection is poised to reduce performance penalties enabling a more sensitive generation of coherent instruments and applications.

In this work we describe the implementation of an optical coherent receiver that uses phase compensation and adaptative optic techniques, as well as digital architectures for signal processing and control. We show experimentally the viability of the approach to improve the efficiency and sensitivity of the receiver. Both free-space optical communications and coherent lidar systems may benefit from use of the methods and techniques derived from this research.