Characterization of atmospheric channel for free space optical communications

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In order to accurately predict free space optical communication performance, knowledge of the refractive index structure parameter (Cn2) and wind profiles is of great interest.

We present our approach to extract these parameters from Shack-Hartmann wavefront sensor (SHWFS) measurements collected by ONERA's FEELINGS optical ground station. The approach is inspired by the Single Coupled Slopes and Intensities Detection and Ranging (SCO-SLIDAR) method [1] and relies on spatio-temporal covariances of wavefront slopes and intensities gathered by the SHWFS. It is first validated with the PICOLO/LISA turbulence emulator bench [2].

References

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