

Atmospheric Propagation of High Power Structured Laser Beams

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Project Summary: Structured light beams have been primarily studied in the low power and linear dynamical regimes. Consequently, there exists a knowledge gap of the involved physics under, e.g., directed energy and free-space applications. This project plans to undertake a deep study of the physics of structured light propagation in the non-linear regime. In particular, high power structured light will be generated from a Gaussian source, utilizing both advanced and in-house synthesized optical elements, and measured within a carefully controlled laboratory environment featuring a turbulence generator. Theoretical and computational models, incorporating novel fluid dynamical coupling, will be developed to generate insight into the subject phenomenon and provide accurate predictions of consequential measurands, e.g., intensity structure and symmetry (breakdown).
