

Abstract Submitted
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New experimental platform for turbulence and turbulent mixing in rotating and accelerating fluids at high Reynolds numbers SERGEI S. ORLOV, Solid State and Photonic Laboratory, Stanford University, SNEZHANA I. ABARZHI, FLASH Center, The University of Chicago — A new high-performance experimental platform for studies of turbulent flows and turbulent mixing in accelerating and rotating fluids is presented. This novel experimental approach is based on ultra-high performance optical holographic data storage technology. The state-of-the-art electro-mechanical, electronic, and laser components allow one to realize and study flows with extremely high Reynolds numbers ($> 10^7$) in a relatively small form-factor, with extremely high spatio-temporal resolutions and bandwidth. The technology can be applied for investigation of a large variety of hydrodynamic problems including fundamental properties of non-Kolmogorov turbulence and turbulent mixing in rotating and accelerating fluids, pre-mixed combustion, and MHD. Unique metrological capabilities of the technology have excellent provisions for the studies of the transports of momentum, angular momentum and energy, as well as scalings, invariants and statistics of complex turbulent flows.

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