Forced Turbulence, Multiscale Dynamics, and Variational Principles HARIS J. CATRAKIS, University of California, Irvine — We consider theoretically fundamental aspects of forced turbulence as well as unforced turbulence, with emphasis on the multiscale properties of turbulent level crossings as well as emphasis on connections to variational principles. The connection between power spectral exponents and level crossing scales in forced turbulence, as well as unforced turbulence, is explored. Also, the connection between variational principles and the behavior of level crossing scales is investigated in both forced and unforced turbulence. In addition, we explore testing of our theoretical considerations using computations and visualizations.

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