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Nathan E. Glatt-Holtz* (negh@indiana.edu), Rawles Hall, 831 East 3rd St, Bloomington, IN 47405. *New Well-Posedness Results for the Equations of Stochastic Fluid Dynamics with Multiplicative Noise.*

The addition of white noise driven terms to the fundamental equations of physics and engineering are used to model numerical and empirical uncertainties. In the context of fluid dynamics such forcing terms have also been employed in the theory of turbulence. Although the study of well posedness for the Stochastic Navier-Stokes Equations goes back to the 1970's with the work of Bensoussan and Temam, many basic questions remain unaddressed. In particular the case of nonlinear multiplicative noise remains a challenging problem. In this talk we introduce some recently developed technical machinery, the so called "comparison lemmas" which may be used to circumvent the difficulty of compactness for certain nonlinear systems. In particular our techniques have led to novel local and global existence results concerning pathwise solutions for both the Navier-Stokes and Primitive Equations. This is joint work with M. Ziane. (Received February 03, 2009)