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Vorticity Fluctuations in Plane Couette Flow JOSE ORTIZ DE ZARATE, Universidad Complutense, JAN V. SENGERS, University of Maryland — In this presentation we evaluate the flow-induced amplification of the thermal noise in plane Couette configuration. The physical origin of the noise is the random nature of molecular collisions, that contribute with a stochastic component to the stress tensor (Landau's fluctuating hydrodynamics). This intrinsic stochastic forcing is then amplified by the mode- coupling mechanisms associated to shear flow. In a linear approximation, noise amplification can be studied by solving stochastic Orr-Sommerfeld and Squire equations. We compare the efficiency of the different mechanisms, being the most important the direct coupling between Squire and Orr-Sommerfed equations. The main effect is to amplify wall-normal vorticity fluctuations with an spanwise modulation at wave number around 1.5, a configuration that resembles the streaks that have been proposed as precursors of the flow instability.

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