Abstract Submitted
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**Direct numerical simulation of axisymmetric laminar low-density jets**[1] DANIEL GOMEZ LENDINEZ, Universidad Carlos III De Madrid, WILFRIED COENEN, University of California San Diego, ALEJANDRO SEVILLA, Universidad Carlos III De Madrid — The stability of submerged laminar axisymmetric low-density jets has been investigated experimentally (Kyle & Sreenivasan 1993, Hallberg & Strykowski 2006) and with linear analysis (Jendoubi & Strykowski 1994, Coenen & Sevilla 2012, Coenen et al. 2017). These jets become globally unstable when the Reynolds number is larger than a certain critical value which depends on the density ratio and on the velocity profile at the injector outlet. In this work, Direct Numerical Simulations using FreeFEM++ (Hecht 2012) with P1 elements for pressure and P2 for velocity and density are performed to complement the above mentioned studies. Density and velocity fields are analyzed at long time showing the unforced space-time evolution of nonlinear disturbances propagating along the jet. Using the Stuart-Landau model to fit the numerical results for the self-excited oscillations we have computed a neutral stability curve that shows good agreement with experiments and stability theory.

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