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Parabolized stability equation (PSE) models for the prediction of mixing noise in turbulent jets: nonlinearity and comparison with experiments[1] TIM COLONIUS, DANIEL RODRIGUEZ, California Institute of Technology, ARNAB SAMANTA, Indian Institute of Science, Bangalore, ANDRE CAVALIERI, PETER JORDAN, Institute Pprime, Poitiers, France, CALIFORNIA INSITUTE OF TECHNOLOGY TEAM, INDIAN INSTITUTE OF SCIENCE COLLABORATION, INSTITUTE PPRIME, POITIERS TEAM — The wavepackets responsible for the generation of the dominant low-frequency noise of turbulent round jets are modeled via PSE. Previous experience shows that wavepackets delivered by linear PSE are in agreement with pressure fluctuations on a near-field microphone array. Nonlinear interactions between PSE modes is the subject of the present effort. Pressure fluctuations in the near-field and hot wire measurements at the jet centerline are used to determine initial amplitudes for the PSE computations, and then perturbed randomly to introduce some degree of nondeterminism. A projection technique is used to compare the noise radiated to the far-field by wavepackets with experiments. First results indicate that nonlinearity is not a determinant factor in the wavepackets evolution, especially for unheated, low Mach number jets, while small variations in the initial conditions might introduce $O(1)$ changes.

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