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On Inflow Boundary Conditions for Large Eddy Simulation of Turbulent Swirling Jets

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Three Large Eddy Simulations have been performed for an unconfined annular swirling jet with different inflow boundary conditions. The adequate specification of these conditions is a decisive issue for such computations. To validate the chosen approach it is usual to compare first and second order moments of the velocity field with the corresponding experimental data. By means of visualizations and frequency spectra we show that good agreement of mean and rms velocities is not, in general, sufficient for a realistic representation of the experimental conditions. The unsteady large-scale structures of the flow must also be taken into account. Also, for swirling jets, the simulation of the actual swirl-generating mechanism is not always needed. A less expensive strategy is proposed.

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