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EFFECTS OF DIFFERENT MEAN VELOCITY RATIOS ON DYNAMICS CHARACTERISTICS OF A COAXIAL JET

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ABSTRACT

The flow field of a coaxial jet configuration having inner and outer diameter ratio $D_i/D_o = 0.33$ is studied for four values of the velocity ratios and $m = U_i/U_o = 5.17, 1.13, 0.77$, and 0.54. The profiles of the mean axial velocity, of the axial turbulence intensities, and of the shear stress are described for the initial and fully zones. The obtained results show the inner potential core length of the coaxial jet strongly depends on the velocity ratio while the outer potential core for jets having velocity ratios greater than unity seems to be insensitive to the velocity ratio. As expected, the inner jet core length is seen to decrease with decreasing velocity ratio; jets with velocity less than unity develop faster than those with m greater than unity and the Reynolds stress show a zero-crossing in the near-region.

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