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On Large Eddy Simulation/Filtered Density Function based Modeling of Circular Bluff Body Configurations. CESAR CELIS, RICARDO FRANCO, Pontificia Universidad Catolica del Peru (PUCP) — Honoring Ted O'Brien. Large eddy simulation/filtered density function (LES/FDF) numerical results of inert and reacting flows characterizing the near wake of bluff body configurations are discussed in this work. Circular bluff body configurations are studied because they feature strong interactions between turbulence and chemical reaction, as well as pollutants formation. All numerical results obtained here are compared to experimental data gathered previously. Parameters particularly analyzed include velocity profiles, turbulent kinetic energy, Reynolds stress and strain rate tensors. A strong anisotropic flow is observed from the obtained results along with a flow recirculation zone consisting of a toroidal vortex. At inert conditions, large turbulent fluctuations are found at the stagnation point region. The observed flow anisotropy is associated with the stagnation point flow. The results discussed here correspond to on-going work involving both bluff body burner configurations and numerical predictions of rather complex phenomena such as soot formation.

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