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Drag reduction using a multi-cavity at the afterbody[1] ENRIQUE SANMIGUEL-ROJAS, Universidad de Córdoba, Spain, ANTONIO MARTÍN-ALCÁNTARA, CÁNDIDO GUTIÉRREZ-MONTES, CARLOS MARTÍNEZ-BAZÁN, Universidad de Jaén, Spain, MANUEL A. BURGOS, Universidad Politécnica de Cartagena, Spain, MANUEL HIDALGO-MARTÍNEZ, Universidad de Córdoba, Spain — We present a numerical study on the drag reduction of a two-dimensional bluff body with a blunt trailing edge, which has a chord length L, body height H and spanwise width W, being $H/W \ll 1$, aligned with a turbulent incompressible free-stream of velocity U_∞, density ρ and viscosity μ. In particular, an extensive parametric study is performed numerically using the IDDES turbulent model, at a Reynolds number, $Re = \rho U_\infty H/\mu = 20000$, to analyze the effect on the drag coefficient C_D of both a single-cavity as a multi-cavity of variable depth h at the base of the body. It is observed within the range, $0 \leq h/H \leq 0.2$, that C_D decreases monotonically reaching an asymptotic value in both cases. In turn, shorter cavity depths are necessary to reach the same drag reduction with a multi-cavity than with a single-cavity. On the other hand, the temporal evolution of the drag coefficient shows a lower standard deviation with a multi-cavity than with a single-cavity, which is manifested in the flow as a wake with a lower level of disorder.

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