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A new hybrid RANS/LES technique based on Reynolds stress reconstruction MICHELE NINI, ANTONELLA ABBA, Politecnico di Milano, MASSIMO GERMANO, Duke University, MARCO RESTELLI, Max Planck Institut — A new hybrid RANS/LES technique, based on the hybrid RANS/LES filter, has been studied. The novelty herein introduced is represented by the reconstruction of the Reynolds stress tensor. As a consequence, no explicit RANS model is needed. The model is implemented in a numerical code based on a high order Discontinuous Galerkin (DG) finite element formulation. The test case considered for numerical simulations is the turbulent channel flow at Mach = 0.2 and the simulations have been carried out for two friction Reynolds number, 180 and 395. The results show that, for coarse grid, the technique can give benefits with respect to the pure LES, confirming that the methodology herein proposed represents a promising approach to the numerical simulation of turbulent flows.

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