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A Method for Interface-Turbulence Forcing in Hybrid LES/RANS Simulations SUAD JAKIRLIC, BJOERN KNIESNER, Darmstadt University of Technology — A computational strategy coupling near-wall, eddy-viscosity-based RANS models with LES in a two-layer Hybrid LES/RANS (HLR) scheme is proposed in the present work. Key questions concerning the coupling of both methods, the inherently steady RANS method and highly-unsteady LES method, are closely connected to the treatment at the interface separating both sub-regions: (1) the exchange of the variables across the LES/RANS interface was adjusted by implicit imposition of the condition of equality of the modeled turbulent viscosities; (2) second issue is the utilisation of a self-adjusting interface position in the course of the simulation; (3) the third issue, the present work is focussing on, addresses the usage of a special forcing technique, which compensates the loss of information due to strong damping in the RANS region by creation of artificial and correlated fluctuations using a method originating from a digital-filter-based generation of inflow data for spatially developing DNS and LES due to Klein et al. (2003). Herewith, the recovery of the fluctuations on the LES side of the interface is accelerated. The model validation is conducted by computing numerous wall-bounded configurations of different geometrical complexity featuring different mean flow and turbulence phenomena.

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