A comparison study of convective schemes in hybrid RANS-LES calculations BRANISLAV BASARA, AVL List GmbH, ZORAN PAVLOVIC, AVL-AST d.o.o. Slovenija — Nowadays it is commonly accepted to report on convections schemes in the case of Large Eddy Simulation (LES) calculations. However, in the case of hybrid RANS-LES calculations, the same discussion seems not to be relevant assuming that calculations are anyway performed on the coarser computational meshes and that the amount of unresolved and modelled turbulence impairs the calculation accuracy more than the error of convection schemes used in calculations. Therefore, we want to tackle this issue by using the Partially Averaged Navier–Stokes (PANS) model as the representative hybrid RANS-LES method but the conclusions derived in this work are equally applicable to other models. We will present results by using the central differencing (CD), MINMOD and SMART schemes but also using CD scheme only locally in the area of low unresolved-to-total ratios of kinetic energy (f_k). The paper will also show the performance of a step blending function, which depends on the prescribed constant value of the ratio f_k and the performance of a smooth function which directly uses the ratio f_k as the blending value. The results will be presented for the flow around the square cylinder.

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