LES of the turbulent wake of the Ahmed car model by Spectral Vanishing Viscosity approach MATTHIEU MINGUEZ, ERIC SERRE, MSNM-GP UMR-6181 CNRS IMT La Jetee Technopole de Chateau-Gombert 38, Rue Frederic Joliot-Curie 13451 MARSEILLE Cedex 20 (France), RICHARD PASQUETTI, Laboratoire J. A. Dieudonne U.M.R. C.N.R.S. No 6621 Universite de Nice Sophia-Antipolis Parc valrose 06108 NICE Cedex 20 (France), DFG-CNRS COLLABORATION — One studies by Large Eddy Simulation the flow around a reference car model, the Ahmed body, for a Reynolds number of 768000 and a slant angle of 25°, as defined in the ERCOFTAC benchmark. The developing tri- dimensionnal flow is fully turbulent, strongly unsteady and with large separation zones. The numerical model is based on a highly accurate method (spectral Chebyshev-Fourier approximation of the solution), including a penalization method to incorporate the obstacle and a domain decomposition technique in the streamwise direction. This LES is based on the Spectral Vanishing Viscosity stabilization method, allowing a damping of the highest frequencies of the solution. A particular attention is given to the treatment of the near wall region in to capture the crucial turbulence level of the slant mixing layer. The topology of the flow is captured with a partial separation zone on the slant and two strong contra- rotating trailing vortices coming off the slant edges. The mean velocity fields as the turbulence levels show a very good agreement with the experiments of reference.

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