Wavelet-based adaptive LES with explicit-filtering. GIULIANO DE STEFANO, University of Naples, OLEG V. VASILYEV, University of Colorado at Boulder — Wavelet-based adaptive large-eddy simulation is a novel approach to the numerical simulation of turbulence, where the coherent energetic eddies are solved for, while modelling the influence of the less energetic coherent/incoherent background flow. The formal separation between resolved and unresolved turbulent velocity field is obtained by wavelet threshold filtering that is inherent to the adaptive wavelet collocation numerical method. A new explicit wavelet filtering strategy is introduced and tested, by considering two different filtering levels: the physical level, which controls the turbulence model, and the numerical level that is responsible for the accuracy of numerical calculations. The theoretical basis for wavelet-based adaptive large-eddy simulation with explicit filtering and consistent dynamic modelling is given. Some numerical experiments are presented for unsteady homogeneous turbulence, demonstrating the existence of grid-independent solutions.