On the "optimal" spatial distribution and directional anisotropy of the filter-width and grid-resolution in large eddy simulation[1] SIAVASH TOOSI, JOHAN LARSSON, University of Maryland — The accuracy of an LES depends directly on the accuracy of the resolved part of the turbulence. The continuing increase in computational power enables the application of LES to increasingly complex flow problems for which the LES community lacks the experience of knowing what the "optimal" or even an "acceptable" grid (or equivalently filter-width distribution) is. The goal of this work is to introduce a systematic approach to finding the "optimal" grid/filter-width distribution and their "optimal" anisotropy. The method is tested first on the turbulent channel flow, mainly to see if it is able to predict the right anisotropy of the filter/grid, and then on the more complicated case of flow over a backward-facing step, to test its ability to predict the right distribution and anisotropy of the filter/grid simultaneously, hence leading to a converged solution.

Siavash Toosi
University of Maryland

Date submitted: 29 Jul 2017   Electronic form version 1.4