# Finite element LES and VMS methods on tetahedral meshes

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Finite element methods for problems given in complex domains are often based on tetrahedral meshes. This talk demonstrates that the so-called rational Large Eddy Simulation model and a projection-based Variational Multiscale method can be extended in a straightforward way to tetrahedral meshes. Numerical studies are performed with an inf-sup stable second order pair of finite elements with discontinuous pressure approximation.

The talk contains several turbulence models on tetrahedral meshes. In particular, it was shown that a FEVMS method with an adaptive large scale space can be extended in a straightforward way to such meshes. Computations were performed with the $P_2^{bubble}/P_1^{disc}$ pair of finite element spaces. One could not distinguish one method to be better than all other ones. Only the adaptive VMS method gave improved results in comparison with the VMS method with uniform static large scale space. In addition, it will be shown at a flow through a reactor that the indicator of the adaptive VMS method predicts the distribution of the turbulence intensities correctly.

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