

# Comparison of Adaptive and Uniform 2D Galerkin Simulations

Andreas Mueller, Michal Kopera and Francis X. Giraldo  
*Naval Postgraduate School, Monterey (California)*

Adaptive mesh refinement generally serves to increase computational efficiency without compromising the accuracy of the numerical solution significantly. However it is an open question in which regions the spatial resolution can actually be coarsened without affecting the accuracy of the result significantly. This question is investigated for the simulation of 2D warm air bubble test cases. For this purpose a very high resolution reference simulation is used to compute the L2-error of different setups of the adaptive mesh refinement. Different possibilities for measuring the efficiency of serial simulations are discussed. The comparison using a serial 2D code is performed for a discontinuous Galerkin method as well as for a Spectral Element method.