

3rd Workshop on Uncertainty Analysis, Lisbon, October 2008

Brief comments and opinions of the 3rd Workshop on CFD Uncertainty Analysis

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Although I have been doing grid sensitivity studies for CFD for many years, the world of uncertainty analysis (particularly establishing confidence limits) is relatively new to me. I found the workshop to be very useful and informative, and, like many workshops, a great way to get experts together to advance the state of the art.

I was particularly impressed by the fact that, over the course of the three workshops, the variations among the participants' solutions for a given model (Spalart-Allmaras in this case) have been diminishing. I think that workshops such as this one are helping to establish this consistency. The fact that there are still outliers (represented here by two commercial codes) is interesting and should probably be investigated further to determine the cause.

It appeared to be a general consensus that far more grid points are needed to lie within the asymptotic range (for a realistic problem) than might have been guessed by most people. Even for 2-D with grid adaptation, Pelletier's work on the back step seems to indicate 100K-500K nodes may be needed. So there seems to be little hope for easily achieving the asymptotic range for realistic 3-D problems in the foreseeable future. Can we ignore the asymptotic range? Maybe... but right now we still need to know the answer to figure out how far off we are, in order to validate and gain confidence in the uncertainty methods.