NON-DETERMINISTIC SIMULATIONS IN CFD

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ABSTRACT

Uncertainty Quantification (UQ) is increasingly recognized as an indispensable component of state-of-the-art scientific computing for enhancing the predictive capabilities of simulation tools. This demands the development of non-deterministic simulation techniques for the computational sciences. The introduction of these UQ methods into Computational Fluid Dynamics (CFD) poses numerous additional challenges. These are, for instance, high computational costs, strong nonlinearities, inherent flow unsteadiness, a potentially large number of uncertainties, significant model uncertainties, and the verification and validation of results. These problems need close attention before the large-scale implementation of UQ in engineering design.

This minisymposium on UQ in CFD is a continuation of the successful session on this topic at the previous ECFD conference in Lisbon in 2010. Previous speakers are invited to present their progress and new contributions from the expanding community are especially solicited. The minisymposium will form a podium for discussing new ideas in this emerging field with emphasis on, but not limited to:

- Efficient and robust algorithms for high-dimensional uncertainty propagation;

- Novel concepts for estimating model uncertainty;

- Decision-making frameworks for minimizing uncertainty in robust optimization;

- Applications to verification and validation processes.

Prospective speakers are encouraged to submit a one-page abstract through the congress website at their earliest convenience but at least before November 29, 2013. Two keynote lecturers with 30-minute presentation slots will be selected from the submitted abstracts.