

# Short introduction to Uncertainty Quantification and application to Hypersonics flows

Pietro Congedo  
INRIA Bordeaux Sud-Ouest

Simulation of aerospace applications, such as atmospheric entries of spacecraft, are challenging problems involving many complex physical phenomena, including rarefied gas effects, aerothermochemistry, radiation, and the response of thermal protection materials to extreme conditions. Reliable predictions require sophisticated physico-chemical models as well as a systematic and comprehensive treatment of model calibration and validation, including the quantification of the uncertainties inherent in such models. It still remains very challenging to establish “error prediction” on the numerical results that account for all uncertainties and errors in order to make sound decisions.

This talk is focused on a very short introduction to Uncertainty quantification and to the presentation of some activities about the application of uncertainty quantification techniques to hypersonic flows.