

# **A DATA DRIVEN APPROACH TO MODELLING AND SIMULATING ATMOSPHERIC ENTRY.**

*J. Graham, F. Morgado, M. Fossati*  
*University of Strathclyde*

This contribution will present the concept and some preliminary results in the application of principal component analysis methods to the prediction of aerodynamic loss during atmospheric entry. Relying on a database of high fidelity solutions, a model order reduction technique based on proper orthogonal decomposition will be presented with the aim of finding a good trade off between computational cost and accuracy in predicting the loads acting on the surface of a spacecraft. The accuracy of the data driven approach and its impact on the entry trajectory will be analysed for the case of the atv cargo spacecraft vehicle.