

# Seminario de Mecánica de Fluidos y Matemática Aplicada

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## Characterization of Spacecraft Reusable Heatshield Materials from Plasma Wind Tunnel Experiments: a Bayesian Inference Approach

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Aerothermodynamics testing in plasma flow facilities is essential for the design and development of aerospace vehicles equipped with a Thermal Protection System (TPS) for atmospheric entry. In the presence of a hot, dissociated plasma flow, the protection material can trigger exothermic chemical reactions on its surface, acting as a catalyst for atomic recombination and releasing part of the heat absorbed during the dissociation of molecules to the vehicle's surface. The determination of the catalytic properties of TPS materials is subjected to experimental and model uncertainties which must be evaluated during the design phase of reusable atmospheric entry vehicles. In this work, a fully Bayesian approach is proposed combining all set of available measurements to infer the properties of two different materials, one commonly used for ground testing as a reference material for plasma flow characterization, assumed to have a well-known catalytic parameter, and the thermal protection material itself.

**Día:**        **lunes 1 de octubre de 2018**  
**Hora:**      13:00  
**Lugar:**    E.T.S.I. Aeronáutica y del Espacio  
              [Sala Torres Quevedo](#), Segunda Planta