Online parameter estimation applied to mixed conduction/radiation heat transfer.

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Abstract

This paper describes online parameter estimation and modeling applied to mixed conduction/radiation heat transfer. It investigates several recent methods such as advanced forms of the extended kalman filter, unscented kalman filters and its application to data coming from experiments conducted in a vacuum chamber. It describes a system where real time temperature data produced in a vacuum chamber could be fitted real time to a thermal model of the experiment at hand. Applications of this technique include real time data generated by spacecrafts or outside payloads while they are in orbit. A case study is undertaken where the online parameter estimation technique is applied to the ground and flight-testing of an experimental payload, namely StarNav –I – an advanced star tracker that of STS-107/Columbia.