AIRCRAFT FUEL ESTIMATION BY LEAST SQUARE TECHNIQUE

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Abstract

A least square estimation technique has been proposed for in-flight fuel estimation for a high performance combat aircraft. This paper presents the details of least square models for aircraft fuel estimation, the procedure for building the least square models and their fidelity to estimate the fuel quantity in the multiple internal fuel tanks of the aircraft from flight data. The performance of the fuel estimation by least square technique has been verified with 56 different post flight data with different maneuvers including probe failure cases and compared with lookup table based estimates, the technique currently being used on the aircraft. Few results of fuel quantity estimates are presented and discussed. Sensitivity of the least square model based fuel estimation technique to probe failures has been studied by simulating multiple probe failures in flight data.

Keywords: *Aircraft fuel estimation, Capacitance probes, Least Square techniques*

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