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Title : A Low Speed Tunnel Semi Free
Dynamic Flying Study of Pitching Deriva-
tives of LCA Delta-5 in Active Control
using MLE Procedure

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Abstract : The results of a low speed wind tunnel study of the pitch stability and control derivatives of a 1/16 scaled L C A Delta-5 model semi-free flown in a single degree of freedom are presented. The static stability derivative, pitch damping derivative, control derivative and the elevator/flap to trim have been generated as functions of trimmed angle of attack from -10 deg to about +30 deg for statically stable centres of gravity locations of 24.7%, 30.2% and the statically unstable CG location of 38.4% of the mean aerodynamic chord.

The study includes synthesis, mechanisation and testing of a control law to obtain an angle of attack control loop for the unstable model in wind tunnel experimentation.

The results provide an insight into the longitudinal pitching moment characteristics of the LCA Delta-5 model, specifically in respect of the critical unstable nature of the configuration. The results are analysed to generate the pitching moment coefficients. The results also provide typical control law candidate for the LCA unstable configuration.