

AERODYNAMIC COEFFICIENT IDENTIFICATION USING MOVING HORIZON ESTIMATION ALGORITHM

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Keywords: Aerodynamics coefficients, Flight Dynamics, Quaternions, Computing Fluid Dynamics, Code Saturne, Exterior Ballistics, Moving Horizon Estimation.

Abstract. The aim of this project is the identification of the aerodynamic coefficients in order to generate a complete aerodynamic description for a projectile flight dynamic. A Moving Horizon Estimation (MHE) algorithm that utilizes adaptive estimation methods to update the parameters of the arrival cost was developed. Simulated motion of the projectile utilizing quaternions is computed and generated as baseline where the full rigid body state is known. With this information, parameter estimator algorithm fits the aerodynamic coefficients. Finally, the Rigid Body Dynamics (RBD) with six degree of freedom (6DOF) model is fed with the estimated aerodynamic coefficients and the free flight behavior of the projectile is computed.