Flight Dynamics Analysis Studies for Unmanned Aerial Systems
UAS-S4 and UAS-S45 From Hydra Technologies

The flight dynamics studies of unmanned aerial systems UAS-S4 and UAS-S45 from Hydra Technologies are presented. In these studies, the aerodynamic coefficients of both UAS-S4 and S45 are determined through various numerical methods, and based mainly on their geometrical data. These methods are classified into two main categories: semi-empirical and Computational Fluid Dynamics CFD. The semi-empirical methodologies are mainly based on the DATCOM well known procedure: DATCOM, Tornado and FDerivatives, which is an in-house code produced at the Laboratory of Applied Research in Active Controls, Avionics and AeroServoElasticity LARCASE. The results obtained using these four methodologies were compared and were very close therefore they demonstrated their accuracy and usefulness in the design of the flight simulator. The global aim of this work is to obtain a high level flight dynamics simulator for both UAS-S4 and S45 that will be useful for pilot training as well as for research in the area of Unmanned Aerial Systems.