

IAF SPACE SYSTEMS SYMPOSIUM (D1)
Technologies to Enable Space Systems (3)

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PARAFOIL MPC GUIDANCE AND PATH FOLLOWING CONTROL FOR D&L PHASE OF
REUSABLE SPACE VEHICLES**Abstract**

The paper presents the design and development of a Model Predictive Control algorithm for the Guidance of an autonomous parafoil together with a path following controller, developed in Romania in the framework of the REVLANGNC project endorsed by the European Space Agency. Both technologies are implemented by using state-of-the-art algorithms tailored for current project specific needs.

Several activities have been performed in the last few years, specific to different steps of the research process. A complete GNC solution has been tailored and verified in several scenarios for the descent and landing guidance, navigation and control system to be used in a parafoil architecture for future European reusable space vehicles.

Encountered issues, as well as implemented solutions to overcome them are presented, along with a performance analysis of the implementation of the new algorithms, highlighting advantages with respect to other existing solutions.

Results obtained so far are very promising and encourage the continuation of the research to further develop these technologies up to TRL 6/7 in a fully representative configuration, together with an increased payload and touchdown landing accuracy.