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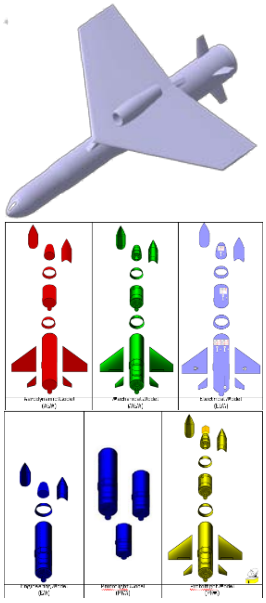
2012 research highlights

Emerging aerospace technologies

Mission analysis and design

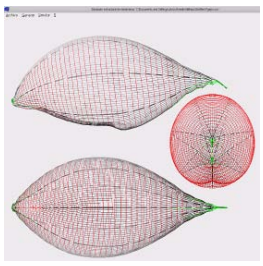
Market research for nanosatellite applications, including databases for existing missions, payloads, subsystems, launchers and other characteristics useful for the analysis of new initiatives.
Design and analysis of several missions for remote sensing and other technology validation.

Aero-ejected launcher



Feasibility studies on small aero-ejected launchers and their subsystems, led by Spanish Aerospace Research Institute (INTA). A huge effort has been carried out to setup a design of a small launcher with national technology, using military carriers. The current research activity focuses on aerodynamics and the three solid-fuel motors. Other areas like electronics and mechanisms are in progress by other partners, as well as market analysis and programmatic issues like certification plans.
The expected performance is 14 kg payload satellite in a 400-km height circular orbit at cost-per-kilogram not larger than existing launching opportunities. The initiative looks for dedicated launchings for future operational missions, in contrast to the current piggy-back options used by most of the nanosatellites dedicated to technology demonstration.
The system is developed under a rigid design-to-cost paradigm, requiring the development of dedicated tools for requirement management and interface control, already available.

Inflatable flying structures



Structural analysis of inflatable structures and their behaviour when acting as buoyancy or lifting shapes. The model can reconstruct the final geometry from initial flat patches, inflation pressure and external airflow.
Currently tested on blimps and other hybrid vehicles under stationary conditions. Applications also on ground flexible structures such hangars or small flexible containers.

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