Assessment of alternative technologies for satellite electric propulsion (30 credits)

Background

The space business is in the middle of a transition. For 60 years space manufacturers have had a strong focus on performance and reliability of their products, with governmental programs as unique buyers. Today, the emergence of more entrepreneurial actors and novel business scenarios (such as mega satellite constellations for worldwide internet coverage) is driving the need for dramatic lead time and cost reduction.

For this reason, next generation space products are expected to demonstrate substantial cost reductions to be competitive. However, cost reduction should not undermine the quality and the value of the product. This makes the assessment of product concepts more difficult to carry out, as new trade-offs between cost and value are involved.

This drives the need for novel methods to be able to trade cost reduction against other dimensions in technology assessment. This thesis looks into how to support the evaluation of technologies for electric satellite propulsion (see figure), by applying a model-based approach.

Thesis questions and expected outcome

This thesis requires to model alternatives technologies for electric propulsion in order to understand the value and the cost of the process in order to select the “best” design. The thesis will start from existing cost/value models but requires to 1) refine the available models and 2) design and write a script that allows to run the simulation of concepts in “batch” and to visualize the results for decision makers.

Student profile and application

Strong interest in modelling and combining programming with applied electro-mechanical engineering design and product development. Desired programming experience in C++, Java, Matlab or Phyton. Application open to any master program. Start in January or after agreement.

Contact information

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