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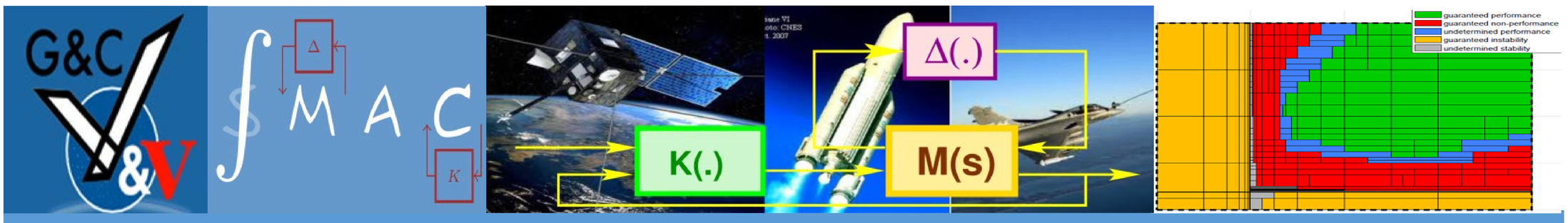


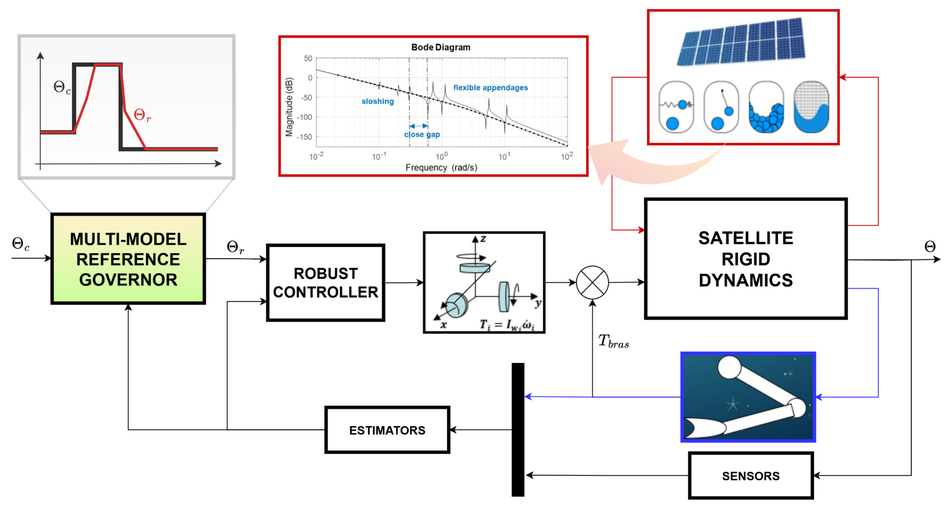
STOchastic Worst-case Analysis Toolbox (STOWAT)

A fast & reliable tool for space control system validation

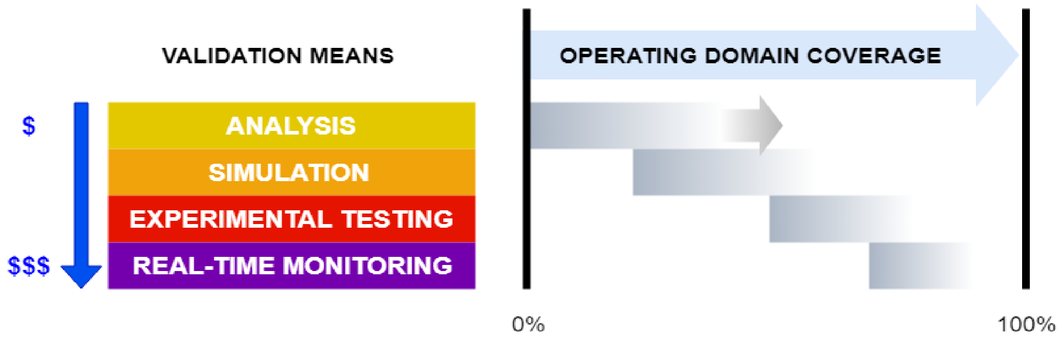
Clément ROOS (ONERA), Jean-Marc BIANNIC (ONERA), Marina TORRES (CNES)

STOWAT in a nutshell

- Dedicated to **probabilistic robustness analysis**, this tool computes **guaranteed bounds on the probability of failure** of control systems in the presence of parametric uncertainties.
- Ideally **complementing Monte-Carlo simulations**, its main feature is to **reliably quantify rare events** in order to avoid invalidating a control law with a low probability of failure.
- It is currently being evaluated by AIRBUS-DS & THALES with the ultimate goal of marketing it under license to **improve future AOCS V&V process** in the space industry.

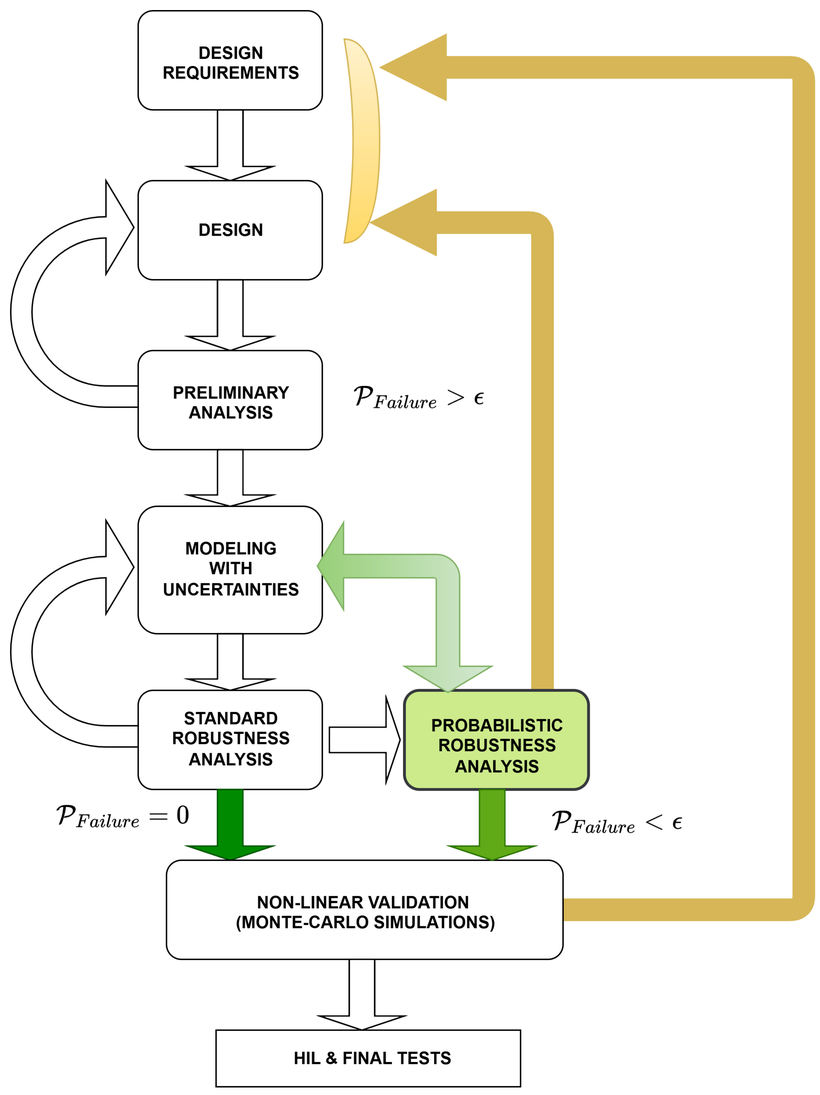


Designed to reduce V&V costs



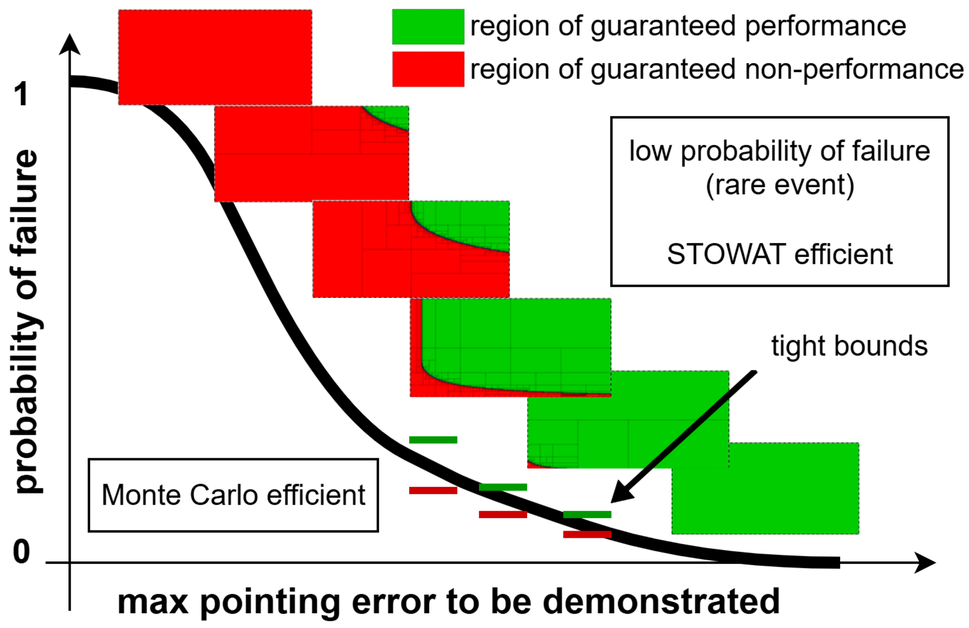
Use low-cost analyses to validate most of the operating domain and better direct costly simulations/experiments.

Integration in a design & validation process



How does it work ?

(compared to Monte Carlo Simulations)



Initially developed with ONERA internal funding, these tools were later improved under ESA contracts, and then through the joint ONERA-CNES **COSOR* program**.
(*) **CO**mmande des **S**ystèmes **O**rbitaux & **R**obotiques

C. Roos, J-M. Biannic, H. Evain
A new step towards the integration of probabilistic μ in the aerospace V&V process
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