

Mutation Testing is a **software testing** approach that consists of ensuring that a test suite can detect faults artificially injected into the software. It entails automatically generating a number of faulty software versions called mutants, measuring the percentage of mutants discovered by the test suite (mutation score), and deriving additional test cases to maximize the number of faults discovered. It has been demonstrated that a high mutation score correlates with effectiveness in detecting real faults.

The scope of the GSTP activity “**Study of mutation testing applicability to space software**” was to study the applicability of mutation testing, to prototype the approach and to develop the corresponding tools and methodology, in the context of space software, with the following **main objectives**:

- Searching for an alternative or complementary **method of measuring the effectiveness of a test suite** (i.e. test-suite verification).
- Searching for an alternative or complementary **method to build a test suite** (i.e. test cases generation).

This activity concluded in the positive applicability of this methodology on space software developments, making it an excellent verification and validation method. The activity produced a toolset, made up of four tools:

- **MASS** (Mutation Analysis for Space Software),
- **DAMA** (DAta-driven Mutation Analysis),
- **SEMuS** (Symbolic Execution-based MUtutant analysis for Space software),
- **DAMTe** (Data-driven Mutation Testing)

This presentation will **introduce this activity** and will present the **results** of the evaluation.