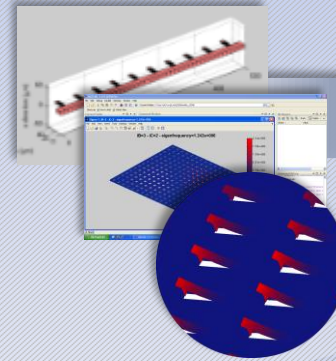# A Design Tool for Cantilevers Arrays

AFMALab

FEMTO-ST presents AFMALab the first cantilever array design tool. A software aimed at improving cantilever array based products and accelerate their development, resulting in reduced time-to-market and resource consumption.

A Specific Technology for Arrays

Integration of multi-scale modeling for fast computation of arrayed systems and a design environment. Parametrized models, visualization of 2-D and 3-D results.
- Matlab environment with possible standalone version,
- SIMBAD design environment,
- Partnership with MEMS Development centers.

Cantilever array design flowchart

AFMALab

| Model Parameter interface |
| Multiscale simulation |
| 3D Visualisation |
| Import & Export Data |

SIMBAD

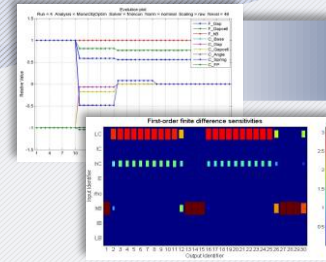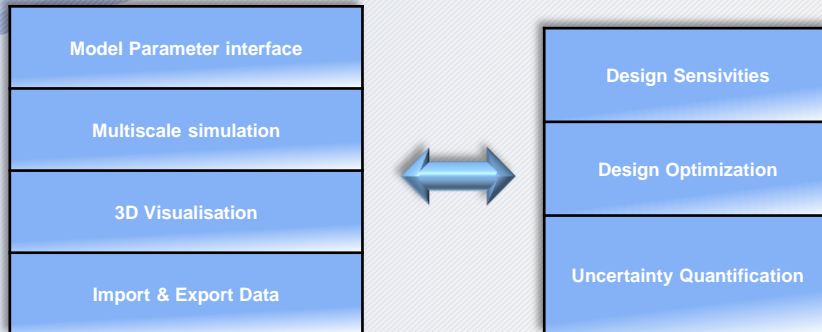| Design Sensivities |
| Design Optimization |
| Uncertainty Quantification |

Cantilever Array Modeling

Geometry: 1D and 2D-arrays with or without AFM tips, frame and cantilevers with parametrized rectangular sections. Physics: modal analysis, static analysis, and transient analysis in structural mechanics. Interaction forces between tips and a surface for AFM applications.
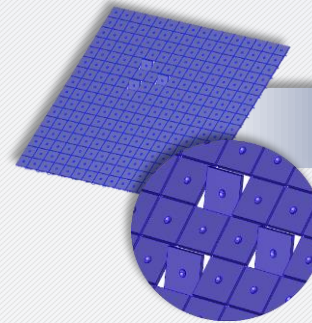
Design Environment

SIMBAD provides a generic simulation-based design tool for design sensitivity, mono-objective optimization, multi-objective optimization, reliability analysis under uncertainty, model validation and uncertainty quantification and Info-gap robustness of design decisions to lack of knowledge.

New Features and Extensions

A tool for computer aided distributed control design is in development.
AFMALab validates new concepts of MEMS array design prior to their use in MEMSALab