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Implementation of Robust Design Optimization Techniques for CST Microwave Studio

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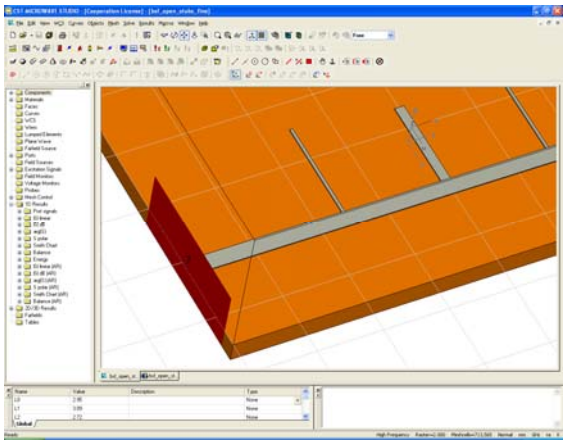
This research-oriented project aims at the development of robust design optimization algorithms for microwave engineering and their implementation in CST Microwave Studio design environment. During the last few years, a number of computationally efficient techniques have been being developed such as space mapping, knowledge-based approaches including tuning, as well robust gradient-based optimization techniques exploiting adjoint sensitivities, to name just a few. These techniques constitute a breakthrough that not only made the classical methods (e.g., gradient-based algorithms) obsolete but, more importantly, allowed electromagnetic -based parametric optimization feasible. There is a rising interest by electromagnetic simulation software manufacturers to incorporate these techniques in their products.



The goal of this project is to develop and implement selected techniques in the CST Microwave Studio which is one of the most popular microwave design environments today. All the algorithms are supposed to be implemented as Visual Basic scripts. The project will also involve working with surrogate-based modeling techniques as well as preparation and experiments on a set of benchmark problems including microstrip and waveguide filters, and antennas.