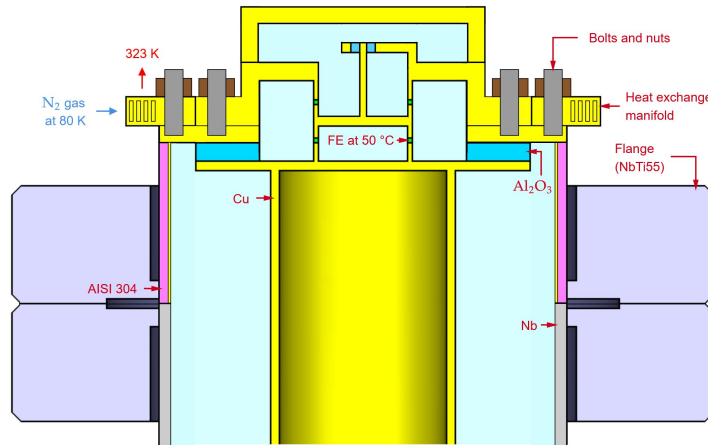
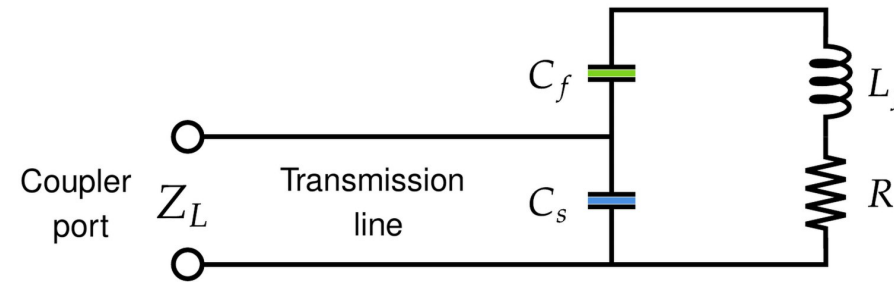


Optimization and modeling of a Fast Reactive Tuner for 1.3 GHz TESLA cavities at MESA

Thermal design at CST Studio as a fine model [1]



FE-FRT lumped circuit model as a coarse model [1]



- Stochastic PDE's/ODE's models incl. heat and elasticity equations
 - Polynomial Chaos expansion to model manufacturing imperfections
 - Modeling by coarse and fine model to accelerate optimization process by space mapping
- Goal: compensation of negative influence of microphonics by FE-FRT

[1] R. Monroya-Villa, I. Ben-Zvi, F. Hug, T. Stengler (2026) Design of a Fast Reactive Tuner for 1.3 GHz TESLA cavities at MESA