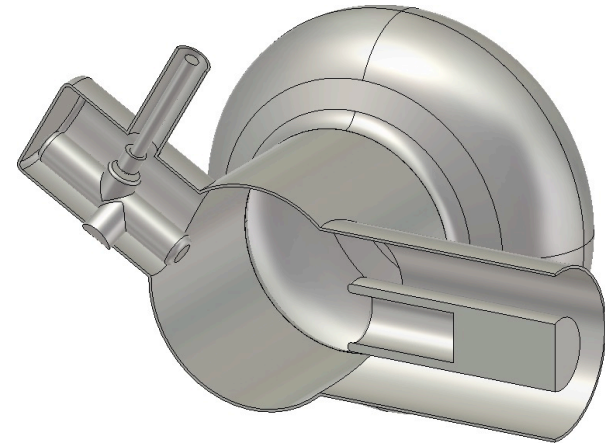# Eigenanalysis of SC Cavities

- **Huge demand for precise cavity simulations**
  - Radio-frequency characterization of superconductor resonators
  - High-precision geometry modeling
  - High-precision boundary representation (PEC, PMC, impedance, port)
  - High-precision complex-valued eigenanalysis
  - High-precision postprocessing (e.g. Kirchhoff)

TESLA Cavity Model

- **Large number of potential cooperation partners**
  - Superconducting cavities for accelerators
  - Development of SRF cavities

Eigenanalysis of SC Cavities

- Research and development
  - **Sensitivity analysis** with respect to a huge amount of model parameters
  - Efficient implementation in already existing HPC environment
  - Seamless workflow from CAD modeling to postprocessing

  - Example: TESLA 3.9 GHz cavity

uncertain downstream
HOM coupler geometry

uncertain upstream
HOM coupler geometry

uncertain 9-cell cavity geometry

uncertain fundamental input coupler geometry