

Overview

- International Muon Collider Study
- TOSCA: Technology of high-gradient superconducting future accelerators (UHH, TUD, UR, BUW)
 - WP4.1 Analyses Framework & Toolbox
 - WP4.2 Dynamic Quadrupole-Resonator Studies
 - WP4.3 Beam impedance calculation from non-orthogonal eigenmodes in lossy structures

Cavity design study for the International Muon Collider

- A high energy muon collider can serve as a possible future energy-frontier-collider for providing collision energies up to 14 TeV, which is significantly beyond the reach of conventional e^+e^- colliders
 - The large muon mass (207 times larger than that of an electron) decreases the problems associated with the synchrotron radiation
 - The main challenges in the muon collider design arise from the short muon lifetime which is $2.2 \mu s$
- Development of an SRF system for the international muon collider:
 - Define an appropriate RF frequency and determine the number of cells per cavity
 - Find appropriate cavity shapes in terms of RF and mechanical aspects
 - Beam loading aspects to define the input power requirements
 - Studies of HOM spectra (in particular evaluation of loss factors)
 - HOM damping approaches using couplers with filters
 - Some longitudinal beam dynamics studies are anticipated

1 x PhD position