AKBP 3: AKBP Accelerator Prize Talks

Time: Tuesday 16:00–16:30 Location: ZHG004

Invited Talk AKBP 3.1 Tue 16:00 ZHG004

SRF accelerating cavity design for the future circular collider

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The Future Circular Collider (FCC-ee) is an ambitious project aimed at conducting high-precision studies of the Z, W, Higgs, and top quark particles. A critical component of this electron-positron collider is the superconducting radiofrequency (SRF) system, which must adapt to the collider's diverse operational modes. The RF system is required to deliver 50 MW per beam to compensate for synchrotron radiation losses in the 91 km ring while accommodating beam currents and RF voltages that can vary by up to two orders of magnitude across different operational modes. This presentation delves into the design and optimization of SRF accelerating cavities, higher-order mode (HOM) couplers, and power couplers tailored for the FCC-ee's main collider and booster. The engineering of the RF system to handle varying beam currents and RF voltages will be presented. Additionally, it highlights novel concepts, including the SWELL cavity, which offers potential advantages beyond FCC-ee.