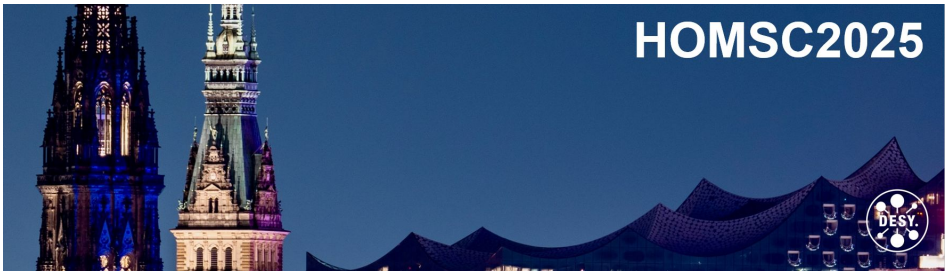

Contribution ID: **21** Type: **Oral contribution**

Dipole mode wakefields and beam dynamics tracking simulations for the UK XFEL main accelerating Linacs

Monday 6 October 2025 12:30 (30 minutes)

The baseline design for the proposed UK XFEL (United Kingdom X-ray Free Electron Laser) facility includes main linear accelerating linacs, which are comprised of 600 9-cell TESLA style superconducting RF cavities, which will accelerate a 1 MHz repetition-rate irregularly spaced composite electron beam comprised of varying bunch charges up to an energies of 8 GeV. Here the TESLA cavities are simulated and the dipole modes excited by the beam are characterised in order to calculate the transverse long-range wakes. We track the particles through 1 km under the influence of these wakefields using the PLACET code and evaluate the transverse emittance dilution of the electron beam. Mitigation strategies are also explored to enhance the beam quality.

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