

# Reinforcement Learning–Guided Dynamic Tuning of a THz Linac

*Tuesday, 31 March 2026 12:00 (2 hours)*

By scaling accelerator operation to THz frequencies, dielectric-lined waveguides (DLWs) can achieve accelerating gradients far higher than conventional RF structures, while supporting modes that couple longitudinal acceleration with transverse focusing. We propose a reinforcement-learning–based dynamic tuner that, using beam distribution information, adjusts the THz phase and amplitude of consecutive DLW stages in real time to maximise electron transmission and energy gain while minimising emittance growth and energy spread under realistic jitter and misalignments.

## Student

Yes

**Primary author:** PECZEK, Filip (The University of Manchester)

**Presenter:** PECZEK, Filip (The University of Manchester)

**Session Classification:** Poster session