

Q and R/Q measurements with modulated beam currents with beam from the Cornell ERL injector

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A search for HOMs in Cornell's ERL main linac cavity installed in a Horizontal Test Cryomodule (HTC) has been carried out using a bunch charge modulation method, as part of the effort towards building an Energy Recovery Linac (ERL). The beam-based HOM measurements offer the significant advantage of being able to detect trapped modes invisible to both the RF pickup probes and HOM damping loads, and allow for measuring the R/Q of the modes. For each HOM detected during the search, measurements were taken to determine its nature (monopole, dipole, etc.), frequency, loaded quality factor and shunt impedance. A selection of the most notable modes found is presented and discussed.

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