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Investigation of micro spill in RF KO extraction using tailored excitation signals

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Radio Frequency Knock Out (RF KO) extraction is used to extract stored particle beams from synchrotrons through transverse excitation, delivering spills of particles for experiments and medical therapy. Minimizing the fluctuations of spill intensity is vital to prevent detector pile-up and interlocks while making most efficient use of the extracted beam. To improve the spill quality, different excitation signals with characteristic frequency spectra are explored. Results of experimental studies at the Heidelberg Ion Beam Therapy Center (HIT) are presented. These demonstrate the possible improvements by tuning multi-band spectra at different harmonics. Particle tracking simulations of the slow extraction process at HIT are used to understand how different excitation signals influence the spill quality.

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Footnotes

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Yes

Primary authors: NIEDERMAYER, Philipp (GSI Helmholtzzentrum für Schwerionenforschung GmbH); CORTÉS GARCÍA, Edgar Cristopher (Deutsches Elektronen-Synchrotron); SINGH, Rahul (GSI Helmholtzzentrum für Schwerionenforschung GmbH); FRANCHETTI, Giuliano (GSI Helmholtzzentrum für Schwerionenforschung GmbH); FELDMEIER, Eike (Heidelberg Ionenstrahl-Therapie Centrum)

Co-author: HABERER, Thomas (Heidelberg Ionenstrahl-Therapie Centrum)

Presenter: NIEDERMAYER, Philipp (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

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