

Beam ripple studies at MedAustron

The intensity ripples in the extracted beam are a crucial topic for clinical treatment, as a constant particle flux is required for optimal operation of the accelerator within safety regulations. Therefore, ripple mitigation techniques are widely used in facilities worldwide.

This talk discusses the intensity ripples at MedAustron by analysing the ripple frequency spectrum and the impact of the ripples on the quality of the beam. Empty Bucket Channeling (EBC) is a common method for mitigating ripples, and its effect on beam quality can be quantified by high-bandwidth intensity measurements. Various extraction techniques such as RF Knockout, Constant Optics Slow Extraction (COSE) and Phase Displacement Extraction (PDE) are compared based on their capability of ripple suppression.

Measurements of the ripple transfer function for different ripple frequencies and amplitudes can be used to identify the components that are most sensitive to ripple transmission, which correlates to the relevance for ripple suppression for these components.

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