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BPM feedback for LLRF energy and phase regulation in charge stripping beamlines

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Charge stripping is inherent for high power ion accelerators such as the FRIB LINAC. However, at high power, strippers require motion to prolong the operational life of the stripping media, or by flowing a liquid Lithium film. The charge stripping process introduces energy losses that vary with the actual Lithium film thickness, which can result in observable beam losses along the tuned beamline at high on-target beam power, above ~100 kW, if not adequately mitigated. BPM phase feedback is used in real-time to compensate for these effects, controlling upstream RF cavities in order to maintain a constant beam energy and phase post-stripper, which significantly reduces beam energy fluctuations.

Footnotes

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