

IFAST-REX: An initiative for the mitigation of beam current fluctuations in slow extraction

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Within the EU-funded activity IFAST, the task REX (Resonance Extraction Improvement) was launched in 2021 as WP 5.3. The IFAST-REX consortium comprises European hadron synchrotron facilities CERN and GSI, the hadron therapy centres CNAO, HIT, MedAustron, MIT and SEEIIST, as well as the companies Barthel HF-Technik and Bergoz Instrumentation. It deals with the crucial challenge of slow extraction in mitigating the current fluctuation on the time scale of typically 0.01 to 10 ms, primarily caused by magnet power supplier ripples. Higher frequency ripples due to the properties of beam excitation methods are also considered. IFAST-REX is organized into four modules: Two modules execute the realization of a high dynamic range low-frequency current transformer and tailored high power amplifiers for beam excitation. The other two modules focus on developing simulation tools for accurate long-term slow extraction and developing diagnostics related to extracted particle detection and analysis. This contribution summarizes the current status of the consortium efforts by indicating to selected results.

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