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Beam Diagnostics for Future Low Energy Storage Rings

Low energy beams are very important for many existing and future accelerator projects, but require development of new diagnostic methods as most of the standard high-energy techniques no longer work. The future facility for low-energy antiproton and ion research (FLAIR) is an example of an accelerator complex providing such diagnostically challenging beams. Its central machine, the ultra-low energy storage ring (USR), will offer worldwide unique conditions for both in-ring studies as well as for experiments requiring extracted slow beams of antiprotons in the keV range.
This contribution presents a set of diagnostic elements for low energy, low intensity charged particle beams. The monitors include a Faraday cup for femtoampere currents detection, a capacitive pick-up for closed-orbit measurements and beam profile monitors based on scintillating screens and secondary electron emission. Although the devices were developed with the USR in mind, they can be applied to other ultra-low energy storage rings and beam lines.

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