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First results with a Base Band Tune (BBQ) measurement system at Solaris

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All CERN circular accelerators are equipped with Base Band Tune (BBQ) measurement systems, based on the direct diode detection technique, allowing measuring tunes of hadron beams with their residual betatron oscillations or very small explicit excitation. In the framework of Future Circular Collider, a study was launched to investigate how such a system would perform with short electron bunches. A prototype system has been recently installed in Solaris light source. The system has immediately allowed an unprecedented detection of residual beam betatron oscillations, whose amplitudes are more than two orders of magnitude lower than the smallest beam oscillations permitting tune measurements with the standard BPM system. The residual oscillations allowed reliable continuous tune measurements, who have also revealed spectral content never observed before. This paper provides an overview of the installed BBQ system and describes first beam measurement results obtained so far. The aim of the paper is also to disseminate new results in the light source community, with the hope for a support in explaining origins of the observed signals.

Footnotes

Funding Agency

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Yes

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