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High speed Tune Measurement using Phase Following on Multi-Bunch Feedback

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A newly re-implemented feature of the Diamond Multi-Bunch Feedback processor (DLS MBF) uses the ability to measure the betatron/synchrotron tunes using a phase locked loop approach, which produces tune readings at many kHz rate.

This function (which we call Tune PLL) provides insight into the dynamic behaviour of systems affecting the machine tunes.

A new application of the Tune PLL measurement is to simultaneously correct the swept tune measurement for dynamic tune shifts during measurement sweeps, allowing for very high precision measurements of the detailed tune profile.
This enables also very slow sweeps allowing the measurement of tunes spectra of extremely weak bunches with high fidelity.

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