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Sub-fs SRF cavity control at CMTB

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Using a novel RF receiver technique based on a carrier-suppression interferometer (CSI), we have achieved sub-femtosecond RF field control stability on a 1.3GHz CW superconducting RF (SRF) cavity at the Cryo-Module Test Bench (CMTB) at DESY. The CSI provides an improved RF sensitivity of a factor 100 and is used in addition to the standard RF down-converter. The CSI signal is added as an amplified error signal to the feedback controller. Performance evaluation is done by an out-of-loop CSI, which is capable to measure the stability of the cavity field relative to the RF reference from the main oscillator.

Summary

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