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## Precision low-noise field detectors

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For a precise detection of the cavity rf-field with a resolution of 0.01 degree (rms) in phase and amplitude smaller than  $5 \cdot 10^{-5}$  (rms), we present a down-converter prototype. The down-converter is designed for a multichannel phase and amplitude readout using an intermediate frequency between 10-100MHz, which is sampled by an ADC. We give an overview of commercial available mixers, present noise sources and discuss how noise, linearity and long term drift limit the precision of field detection.

In addition we study the beam jitter induced by these noise sources within the regulation.

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