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Report on latest developments of electro-optic pulse shape measurements at European XFEL and FLASH

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Over the past years Electro-optical (EO) crystal-based mixing techniques are gaining interest to characterize electric fields of THz waveforms with high temporal resolution, single-shot capability and high data rate acquisition.

Those EO-techniques are equally suited for various THz sources, utilising either directly the electron bunch coulomb field for bunch length monitoring, or for characterizing THz waveforms from electron-based or laser-based THz generation setups.

In the context of electro-optical diagnostics (EOD) for bunch length monitoring, promising results have been obtained with so-called diversity decoding schemes, using multiple simultaneous measurements and sophisticated algorithms for resolving ultra-short waveforms well below 1ps length, while still keeping long acquisition windows.

Here we present the first results of this novel method applied to the EOD-Setups at DESY.

Summary

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