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Terahertz-based monitoring of X-ray pulse properties

With the rapid progress of versatile ultrafast x-ray spectroscopy techniques and more sophisticated data analysis tools, accurate single-pulse information on the arrival time, duration, and shape of x-ray and XUV pulses becomes essential. Here, we demonstrate that XUV pulses can be converted into terahertz electromagnetic pulses. We observe that the duration, arrival time, and energy of each individual XUV pulse is encoded in the waveform of the associated terahertz pulses and can, thus, be readily deduced from single-shot terahertz time-domain detection. The underlying principle is based on a novel spintronic THz emitter and is applicable for light pulses in the whole electro-magnetic spectrum. The potential for an X-ray pulse duration monitor is discussed.

Speed talk:

Normal speed talk selection

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