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Cost-effective time-stretch Terahertz electro-optic recorders, by using 1550 nm laser probes

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Photonic time-stretch is a powerful method for recording electro-optic signals with terahertz bandwidth and high repetition rates. The method consist of modulating a chirped laser probe with the signal of interest. Then, the laser pulse is stretched it in time up to several nanoseconds, so that it can be read using an oscilloscope or ADC board. This technique has been shown to be efficient for monitoring the dynamics of Coherent Synchrotron Radiation (CSR) at SOLEIL, and to study electron bunch shape dynamics at KARA. However, the use of this technique has been strongly limited by the need of high bandwidth and costly oscilloscopes required for the readout. We present here a new design that allows a considerable reduction of the required oscilloscope bandwidth. A key point consists of using the 1550 nm wavelength for the probe. We will also present results obtained at SOLEIL, where THz pulses have been recorded, in single-shot and at MHz repetition rates, using an oscilloscope and ADC board with 1 to 3 GHz bandwidth.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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