

High Field THz Science using Linac-based Sources

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We report on recent experiments using single-cycle THz frequency light pulses generated by the LCLS electron beam with field amplitudes comparable to bonding fields in solids. THz fields with amplitudes of ~ 20 MV/cm are generated and characterized spectrally using a michelson interferometer and temporally making use of the high fields to carry out nonlinear autocorrelations sensitive to the pulse shape. A brief introduction to ultrafast x-ray experiments will also be presented as they relate to new opportunities for combined THz/x-ray experiments .