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Predicting the generation of THz fields based on measurements of amplitude and phase of the input field PETER POWERS, WENZAO LI, JOSEPH HAUS, QIWEN ZHAN, University of Dayton — A common technique for terahertz (THz) generation is the optical rectification of an ultrashort laser pulse in ZnTe. The resultant THz field is dependent on the input field properties as well as the dispersion and loss in the optical rectification crystal. After the THz field is generated it propagates through the atmosphere for a set distance after which it can be measured using a gated electro-optic measurement. With a complete knowledge of the input pulse, the material dispersion and loss properties, and the transmission properties through the atmosphere, it is possible to model the measured THz field. We will present a model that predicts the THz field based on direct measurement of the input field using frequency resolved optical gating (FROG), the dispersion and loss properties of ZnTe, and the transmission properties of the atmosphere. The pulse shape of the ultrashort pulse can be modified using a grating compressor to frequency chirp the input field. We will compare the results of the model with the experimentally measured THz field for several different pulse shapes.

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