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Abstract:In terahertz pulsed imaging (TPI), a deconvolution process is usually applied as an inverse operation to extract the sample impulse function for further imaging or spectroscopic analysis. Often, such deconvolution is achieved by direct inverse filtering (IF) or IF with a coupled low-pass or double Gaussian filter. However, the low-pass or double Gaussian filter cannot cope well with both suppressing noise and retrieving localized terahertz pulses and they often result in over-smoothing. Here, we apply the iterative total variation method to the deconvolution process in TPI with a view to enhance the sample impulse function and generate better terahertz images. Experiments with both simulated and raw data validate a better performance for the proposed approach.