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Abstract:An imaging system based on the transmission and reflection modes in the terahertz (THz) region is developed by using a backward-wave oscillator (BWO) as source, a Golay-Cell as detector, and an oscilloscope as data acquisition unit. The system software based on the oscilloscope is designed to control the object movement, and the capture and display of the continuous THz wave image data. The imaging of different objects is tested at the frequencies of 450 GHz and 890 GHz to show the validity of the imaging system at room temperature. The influence of object's humidity and thickness, incident wavelength, and translation step on the THz imaging is discussed in details. The direct gray level transformation method and the histogram equalization method are adopted to process the original data to obtain high-quality THz images. © 2011-2012 IEEE.
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