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Title:THz imaging radar for standoff personnel screening

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Abstract:A summary of the NASA Jet Propulsion Laboratory's 675 GHz imaging radar is presented, with an emphasis on several key design aspects that enable fast, reliable through-clothes imaging of person-borne concealed objects. Using the frequency-modulated continuous-wave (FMCW) radar technique with a nearly 30 GHz bandwidth, sub-centimeter range resolution is achieved. To optimize the radar's range resolution, a reliable software calibration procedure compensates for signal distortion from radar waveform nonlinearities. Low-noise, high dynamic range detection comes from the radar's heterodyne RF architecture, low-noise chirp source, and high-performance 675 GHz transceiver. The radar's optical design permits low-distortion fast beam scanning for single-pixel imaging, and a real-time radar image frame rate of 1 Hz is now possible. Still faster speeds are on the horizon as multi-beam THz transceivers are developed.

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