

Abstract Submitted
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Terahertz time-domain spectroscopy of cotton sheets YANHAN ZHU, Department of Electrical and Computer Engineering and Nano Tech Center, Texas Tech University, Lubbock, TX 79409, MARK HOLTZ, Department of Physics and Nano Tech Center, Texas Tech University, Lubbock, TX 79409, AYRTON BERNUSSI, Department of Electrical and Computer Engineering and Nano Tech Center, Texas Tech University, Lubbock, TX 79409 — The transmission of cotton is measured using time-domain spectroscopy in the terahertz (THz) frequency range, from 0.1 to 1.5 THz. An effective medium approximation is used to model the combined cotton and air comprising the samples, and the refractive index of cotton fibers determined. The imaginary part of the refractive index varies across this frequency range with corresponding attenuation coefficient increasing from ~ 2 to $\sim 12 \text{ cm}^{-1}$, while the real part remains constant at $n \sim 1.144$. The effect of moisture content is systematically examined and absorption of the samples determined. Concealed material detection was tested by measuring the 1.44-THz absorption band of representative substance D-Glucose embedded in cotton sheets.

Yanhan Zhu
Dept of Electrical and Computer Engineering and Nano Tech Center,
Texas Tech University, Lubbock, TX 79409

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