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Title:Complex permittivity determination of lossy materials at millimeter and terahertz frequencies using free-space amplitude measurements
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Abstract:A free-space measurement method has been proposed for complex permittivity determination of lossy materials at millimeter and terahertz frequencies. The method relies on the Fabry-Perot interference effect between two identical samples separated by a varying air region. We derived a general metric function for fast and accurate complex permittivity determination of lossy materials using intensity data of transmittance power measurements. We have shown that via a graphical method, unique permittivity retrieval is possible using only two measurements of transmittance data corresponding to different distances between identical lossy samples. We have validated the proposed method by performing a numerical analysis.
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