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Signal Restoration from Atmospheric Degradation in Terahertz Spectroscopy DONG HO WU, Naval Research Laboratory, SEONG KONG, Temple University — We presents a method of restoring signals in Terahertz (THz) spectroscopy by removing the distortion from the observed THz signals. The distortion is generated by the absorption and scattering of gas molecules and water vapor in the atmosphere, during the transmission of THz beams through the air from the source to the spectrometer. Such atmospheric degradation causes spurious spectral dips and peaks in the THz spectrum, which often obscure the spectral peaks specific to the material of interest. This fact makes it challenging to measure the THz spectroscopic signatures of objects at a distance in a humid air environment. A THz signal restoration filter based on an artificial neural network model can be very effective in removing noisy absorption peaks caused by atmospheric degradation in THz spectra.

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