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Title:Experimental comparison of performance degradation from terahertz and infrared wireless links in fog
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Abstract:We describe a lab setup for analyzing impairments of terahertz (THz) and infrared (IR) free space links caused by local refraction index changes in the signal's propagation paths that could be induced by turbulence, particles, humidity, etc. A THz signal comprising a 2.5 Gb/s data load modulated on a carrier at 625 GHz, is launched through a weather emulating chamber, detected, and its performance analyzed. An IR beam at 1.5 um wavelength carrying the same data load is superposed with the THz beam, propagating through the same weather conditions and also performance analyzed. We modulate the IR channel with a usual non-return-to-zero (NRZ) format but use duobinary coding for driving our THz source, which enables signaling at high data rate and higher output power. As both beams pass through the same channel perturbations and as their degradations are recorded simultaneously we can simultaneously compare the weather impact on both. We investigate scintillation and fog attenuation effects for the THz and IR signals by measuring bit error rates (BER), signal power, and phase front distortions. © 2012 Optical Society of America.
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