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Title:Laser air photonics: Beyond the terahertz gap

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Abstract:Through the ionization process, the very air that we breath is capable of generating terahertz (THz) electromagnetic field strengths greater than 1 MV/cm, useful bandwidths of over 100 THz, and highly directional emission patterns. Following the ionization of air, the emitted air-plasma fluorescence or acoustics can serve as an omnidirectional, broadband, THz wave sensor. Here we review significant advances in laser air photonics that help to close the "THz gap," enabling ultra-broadband THz wave generation and detection, for applications including materials characterization and non-destructive evaluation. The feasibility for remote sensing, as well as the remaining challenges and future opportunities are also discussed. © 2012 Elsevier Ltd.

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