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Broadband Microwave Emission from Laser Plasmas Generated in Water Droplets ANNA JANICEK, University of New Mexico, JENNIFER ELLE, ADRIAN LUCERO, Air Force Research Laboratory, ALEXANDER ENGLÉSBE, Navy Research Laboratory, ANDREAS SCHMITT-SODY, Air Force Research Laboratory — A high-power ultrashort laser pulse focused in air generates a plasma that radiates broadband electromagnetic waves. The transient current source responsible for the radiation remains an open area of study. A laser plasma is generated in the presence of water droplets produced by a humidifier to investigate the physics governing the amplification of radiation at microwave frequencies in comparison to radiation quantities created by laser plasmas generated in air. A microwave horn is used to measure the radial pattern of radio frequencies (RF) from 2 to 13.6 GHz produced by the laser plasma. The extinction coefficient of the water vapor-based fog is determined by the transmittance of continuous wave lasers through the interaction region. Our research demonstrates a relationship between the density of the water droplets and the laser plasma radiation mechanism.

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