

Abstract Submitted
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Investigation of low frequency molecular Bremsstrahlung radiation from laser induced breakdown of air¹ PREM KIRAN PATURI², VINOOTH KUMAR LAKSHMINARAYANAN, MANIKANTA ELLE, LEELA CHELIKANI, ACRHEM, University of Hyderabad, ACRHEM TEAM — Low frequency electromagnetic radiation (30-1000 MHz), due to molecular Bremsstrahlung, from ns and ps laser induced breakdown (LIB) of atmospheric air is studied. In the plasma formed by the LIB of atmospheric air, interaction of charged particles with neutral clusters of atoms and molecules result in the emission of low frequency radiation. With increasing laser intensity, the plasma frequency (ω_P) comes closer to the laser frequency (ω_L), leading to higher degree of ionization. This is observed to reduce the electron-neutral interactions decreasing the low frequency emissions. Thus the emissions from ps LIB are 2-3 orders smaller than those from ns LIB. While traversing from the loose to tight focusing conditions, the emissions from ns LIB and ps LIB were observed to be increasing and decreasing, respectively. This confirms the role of the number of seed electrons and their interaction with neutrals on the low frequency emissions. The emissions were observed to be spectral selective, dependent on the polarization state of the input laser pulses and the detecting antenna.

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