

INVESTIGATING NON-INCANDESCENCE EMISSION DURING LASER INDUCED INCANDESCENCE EXPERIMENTS ON AEROSOLIZED PLASMONIC NANOPARTICLES

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ABSTRACT. Time-resolved laser-induced incandescence (TiRe-LII) experiments conducted on aerosolized Ag, commercial soot and Au nanoparticles energized with a 1064 nm laser pulse. Detected TiRe-LII signal from aerosolized Ag nanoparticles suggest that the observed signal could originate from electron neutral bremsstrahlung and not of incandescence origin. A new model is proposed based on plasmonically-enhanced photoemission of electrons from Ag nanoparticles. The interaction of the electrons with buffer gas neutral species leads to inverse neutral bremsstrahlung absorption of the laser pulse as well as neutral bremsstrahlung emission. The new model could potentially explain some of the anomalies observed during TiRe-LII experiments as a secondary signal contaminating the original incandescence signal.