Abstract Submitted
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Electric field measurements in high-pressure hydrogen environments with a few nanosecond time resolutions KAZUNOBU KOBAYASHI, TSUYOHITO ITO, Osaka University, UWE CZARNETZKI, Ruhr-University Bochum, SATOSHI HAMAGUCHI, Osaka University — Coherent Raman scattering (CRS) measurement is a promising technique for measuring electric field in high-pressure environments. In this study, we demonstrate electric field measurements with a few nanosecond time resolutions in high-pressure hydrogen environments. The measurements are performed within the gap between two electrodes driven by pulsed nanosecond voltages. Two pulsed ns laser beams (532 nm and 683 nm) are employed for the measurements. In hydrogen molecules those two laser beams together with the electric field induce a coherent IR signal at a wavelength of 2.4 μm. Without discharge, the square root of the IR strength is proportional to the applied voltage, which is measured with a voltage probe and an oscilloscope at the powered electrode; suggesting that the measurements are successfully performed with a few ns time resolutions. Measurements with dielectric barrier discharges show reductions of the electric field probably due to charges near/on the dielectric barrier.

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