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Electric field measurements in near-atmospheric pressure nitrogen and air based on a four-wave mixing scheme SARAH MUELLER, Institute for Plasma and Atomic Physics, Ruhr-Universitaet Bochum, TSUYOHITO ITO, Frontier Research Base for Young Researchers, Osaka University, KAZUNOBU KOBAYASHI, Center for Atomic and Molecular Technologies, Osaka University, DIRK LUGGENHOELSCHER, UWE CZARNETZKI, Institute for Plasma and Atomic Physics, Ruhr-Universitaet Bochum, SATOSHI HAMAGUCHI, Center for Atomic and Molecular Technologies, Osaka University — Electric field induced coherent Raman scattering (E-CRS) measurement is a promising technique for measuring electric fields in high-pressure environments and was first demonstrated with hydrogen molecules. In this study, we have demonstrated electric field measurements by using nitrogen molecules. Two pulsed ns laser beams (532 nm and 607 nm) are employed for the measurement. In nitrogen molecules those two laser beams together with the electric field induce a coherent IR signal at a wavelength of 4.29 μm . In our current experimental setup, the minimum detectable field strength in open air is about 100 Vmm⁻¹, which is sufficiently small compared with the average field present in typical microdischarges. No further knowledge of other gas/plasma parameters such as the nitrogen density is required for the measurement. Further details on the techniques as well as measurement results in microdischarges will be presented.

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