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A Laser-based Measurement System for Atmospheric Pressure Plasmas MARK BOWDEN, Open University, UK, RONAN FAULKNER, MIKE HOPKINS, Dublin City University, Ireland — Plasmas operated at atmospheric pressure are the subject of an increasing amount of basic and application-based research. Due to the small size of the discharge regions, in-situ measurement of plasma properties is difficult, and research often is based on simulation studies or on relatively simple measurements such as emission spectroscopy. Laser-based methods have the potential to provide time- and space-resolved measurement of plasma properties but until now have rarely been applied. To increase the ease of laser-based measurements in atmospheric conditions, we have developed an instrument that significantly enhances the amount of signal that is detected during a laser scattering or a laser fluorescence measurement. An external cavity is used with the measurement laser so that the measurement volume is repeatedly probed with the same laser beam. In this paper, the instrument will be described together with data from test measurements.

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