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Vectorial Electric Field Characterization Of Plasmas Using An Optical Probe FARAH ALJAMMAL, GWENAEL GABORIT[1], IMEP-LAHC, Universite Savoie Mont Blanc, France, LAURENCE GALTIER, GUILLAUME REVILLOD, KAPTEOS, Alpespace, Sainte-Helene du Lac, France, SYLVAIN ISENI, REMI DUSSART, GREMI, CNRS, Universite d'Orleans, France, LIONEL DUVILLARET, KAPTEOS, Alpespace, Sainte-Helene du Lac, France — Since several years, there has been an impressive revival of interest in the characterization of discharges and Plasma due to their wide range of application. Our study is focusing on the measurement of electric (E) field associated to non-equilibrium atmospheric pressure plasmas such as DBD, ionisation waves(IW) and micro discharges. For that purpose, we have designed and realized a fully dielectric and millimeter sized optical probe based on the Pockels effect, also called electro-optic (EO) effect[1].This probe is coupled to an optoelectronic measurement bench delivering a voltage proportional to one E-field eigen component. The measurement can be performed in real time from some 10 Hz up to several GHz with a dynamic exceeding exceeds 120 dB. The investigation of the very near field of the ionized media concerns both AC and DC plasma: -determination of the breakdown voltage/field strength, -transient evolution of the field vector induced IW, -vectorial mapping of two eigen field components[2], -non-disturbing probe in the field to be measured. Further improvements of the EO technique will also be presented. [1] G. Gaborit et al, IEEE Trans.on Plas. Sci. 42(5),1265-1273,2014. [2] arXiv:1709.03109v1 [physics.plasm-ph]

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