

Abstract Submitted  
for the GEC18 Meeting of  
The American Physical Society

**Student Excellence Award Finalist: Coupling induced changes of complex samples to the experienced electric field during a plasma-surface interaction using Mueller polarimetry** ELMAR SLIKBOER, Ecole Polytechnique, France, ANA SOBOTA, Eindhoven University of Technology, Netherlands, ENRIC GARCIA-CAUREL, OLIVIER GUAITELLA, Ecole Polytechnique, France — Mueller polarimetry is applied to characterize how complex samples (e.g. biomedical / organic layers) change during a plasma exposure while simultaneously measuring the electric field to which they are exposed to. Recently, new advances have been made by using imaging Mueller polarimetry on electro-optic crystals following different approaches allowing the imaging of all the individual electric field components separately (axial and radial), together with the temperature pattern formed inside the target. Now imaging Mueller polarimetry is used as an optical diagnostic technique for the first time to examine the Mueller matrix of a combined sample consisting of a complex material on top of an electro-optic crystal. The combined sample is exposed to guided ionization waves generated by a non-thermal atmospheric pressure plasma jet. The analysis of the measured Mueller matrices separates depolarization caused by surface properties of the complex sample from the retardance which is caused by the electric field going through it. This unique diagnostic allows to couple directly the spatial dependent changes of a sample under exposure of a plasma jet to the inhomogeneous electric field it experiences.

Elmar Slikboer  
Ecole Polytechnique

Date submitted: 10 Jul 2018

Electronic form version 1.4