

Abstract Submitted  
for the GEC14 Meeting of  
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**Surface modification due to atmospheric pressure plasma treatment during film growth of silicon dioxide like and amorphous hydrogenated carbon material**<sup>1</sup> KATJA RUEGNER, RUEDIGER REUTER, ACHIM VON KEUDELL, JAN BENEDIKT, Ruhr-Uni Bochum, RD Plasmas with Complex Interactions — Plasma deposition of silicon dioxide ( $\text{SiO}_2$ ) or amorphous hydrogenated carbon (a-C:H) at atmospheric pressure is a promising tool for industrial applications.  $\text{SiO}_2$  is used as scratch resistant layers, as protection against corrosion or as gas diffusion barrier layers. a-C:H is of special interest due to its optical, electrical, biocompatible and mechanical properties, which are tunable, depending on the bonding state of carbon. Besides the deposition of material, atmospheric pressure plasma jets (APPJ) can be used to modify the surface of the deposited films during their growth. Deposition and the treatment are realized in the same chamber, were both jets face a rotating substrate. Therefore, deposition and treatment of the same trace can be performed in an alternating manner. Further, in-situ FTIR is applied. For the deposition an APPJ with two parallel electrodes is used, operating with either He/HMDSO in the case of  $\text{SiO}_2$  deposition or He/ $\text{C}_2\text{H}_2$  in the case of a-C:H deposition. For the treatment either the APPJ or a coaxial jet with different gas mixtures is used. For the deposition of  $\text{SiO}_2$ -like films the treatment with a He/ $\text{O}_2$ , a He/ $\text{N}_2$ , and an Ar plasma during the film growth have shown significant changes in the film structure. The influence of treatments on a-C:H film is currently under investigation.

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