Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Heated probe diagnostic inside of the gas aggregation nanocluster source.[1] ANNA KOLPAKOVA, ARTEM SHELEMIN, JAROSLAV KOUSAL, PAVEL KUDRNA, MILAN TICHY, HYNEK BIEDERMAN, Charles University in Prague, Faculty of Mathematics and Physics, V Holeovickch 2, 180 00 Prague 8, SURFACE AND PLASMA SCIENCE TEAM — Gas aggregation cluster sources (GAS) usually operate outside common working conditions of most magnetrons and the size of nanoparticles created in GAS is below that commonly studied in dusty plasmas. Therefore, experimental data obtained inside the GAS are important for better understanding of process of nanoparticles formation. In order to study the conditions inside the gas aggregation chamber, special "diagnostic GAS" has been constructed. It allows simultaneous monitoring (or spatial profiling) by means of optical emission spectroscopy, mass spectrometry and probe diagnostic. Data obtained from Langmuir and heated probes map the plasma parameters in two dimensions - radial and axial. Titanium has been studied as an example of metal for which the reactive gas in the chamber starts nanoparticles production. Three basic situations were investigated: sputtering from clean titanium target in argon, sputtering from partially pre-oxidized target and sputtering with oxygen introduced into the discharge. It was found that during formation of nanoparticles the plasma parameters differ strongly from the situation without nanoparticles. These experimental data will support the efforts of more realistic modeling of the process.

[1]Czech Science Foundation 15-00863S

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Date submitted: 10 Jun 2016 Electronic form version 1.4