Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Design of a microwave low-temperature plasma reactor used for simulating plasma interactions with mixed materials targets GUILLAUME LOMBARDI, LIGIA COLINA DELACQUA, MICHAEL REDOLFI, ARMELLE MICHAU, XAVIER BONNIN, DOMINIQUE VREL, KHALED HASSOUNI, CNRS LIMHP, Universite Paris Nord, 99 Avenue J.-B. Clement F-93430 Villetaneuse, France — We have developed a low-temperature plasma reactor to simulate some of the plasma/surface processes occurring under the divertor dome of tokamaks, with an emphasis on mixed materials targets and dust production. We wish to address issues related to the chemistry of erosion products, along with transport, and redeposition in parasitic plasma environments, as expected in ITER. We detail the design steps to build the plasma source using a new multi-bipolar ECR source technology, with plasma ignition through pencil sources arranged in a circle, providing for an elevated electron temperature and sustained plasma density. Two erosion targets, located above and below the sources, are exposed to the plasma. These targets types are considered: 1/ Pie-shaped multiple sectors of single material (C, W, and/or a Be-like element); 2/ Single sector made up of a suitable alloy; 3/ A tungsten or carbon blank on which powder samples of mixed materials have been deposited. These latter samples are to be obtained by mechano-synthesis (stoichiometric compositions out of chemical equilibrium).

Guillaume Lombardi
CNRS LIMHP, Universite Paris Nord,
99 Avenue J.-B. Clement F-93430 Villetaneuse, France

Date submitted: 04 Jun 2010 Electronic form version 1.4