

Abstract Submitted
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Modeling of RF Magnetron Plasma in N₂ with dielectric target STEVEN ARBELTIER, LPGP UMR 8578 CNRS-Universit Paris-Sud, Orsay, France / CEA, LETI, Minatec Campus, 17 rue des Martyrs, Grenoble, France, ADRIEN REVEL, LPGP UMR 8578 CNRS-Universit Paris-Sud, Orsay, France, FRDRIC SABARY, CEA, Le Ripault, France, CHRISTOPHE SECOUARD, CEA, LETI, Minatec Campus, 17 rue des Martyrs, Grenoble, France, TIBERIU MINEA, LPGP UMR 8578 CNRS-Universit Paris-Sud, Orsay, France — Thin film batteries technology requires a solid electrolyte suitable for its operation. One option is to use LiPON deposited from Li₃PO₄ target by radio frequency magnetron sputtering in nitrogen plasma. Despite the successful implementation of this technology, the processes occurring into the plasma and at the substrate during deposition need to be well understood. Modelling is an interesting approach to study the undergoing phenomena such as the quantification of plasma species, the potential evolution in the reactor, the shape of the racetrack and the trajectories of sputtered species. The present results are obtained from two models, (i) a 0D model which describes the plasma kinetic and (ii) a 2D model assuming the axial symmetry. The latter uses a Particle-In-Cell Monte-Carlo approach and self-consistently describes the plasma creation and charged particles trajectories in the reactor. The geometry and the magnetic field correspond to a real CEA-LETI reactor. The dielectric target is 6” diameter. Radiofrequency polarization of the target is taken into account in the model. Results on the evolution of ions density in plasma, the electric-field and the self-bias on the target, are discussed.

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