Contribution ID: **1188** Type: **Oral**

Test beds for electron emission studies

Monday 24 June 2019 17:15 (15 minutes)

For electrodes coated with thin insulating layers, material properties like emissivity, stability, radiation endurance are key parameters for successful application in plasma physics, space industry or accelerator technology. In this paper, we report on test beds used at CEA for basic physics experiments dealing with material properties. Two studies are presented:
- The first one is dedicated to the characterisation of material under controlled field emission conditions. The experimental set up is presented as well as the results of the characterisation of pure metallic material or insulating coated metallic electrode.

- The second study deals with Electron Induced Electron Emission (EIEE) from a thin insulating layer deposited on top of a metallic electrode. The main experimental results are reported. They confirm that emission properties depend on the layer thickness, on the bias voltage and on the primary current intensity. All these dependencies can be qualitatively explained by surface charging effects which occur when the metallic back electrode cannot supply a sufficient amount of current to balance out the charge in excess. The experimental set up and results are presented and discussed via two mechanisms: Radiation Induced Conductivity (RIC) and electron injection from the back barrier into the conduction band of the insulator governed by the internal electric field strength.

Authors: CARON, Michel (CEA); TOURY, Martial (CEA); Mr HOURDIN, Laurent (CEA); Mr NICOLAS, Remi (CEA); Mr ETCHESSAHAR, Bertrand (CEA); Mr ROSOL, Rodolphe (CEA); Mr MAGNAN, Jerome (CEA); Mr MAISONY, Remi (CEA)

Presenter: CARON, Michel (CEA)

Session Classification: 3.1 Plasma, Ion, and Electron Sources I

Track Classification: 3.1 Plasma, Ion and Electron Sources