

NanoRadMet: Development of Multi-Purpose, Low Mass, Beam Profile Monitors by Nanometric Metal Films Deposition

Thursday, 28 May 2020 16:18 (18 minutes)

In the IRRAD Facility at CERN, radiation hardness tests are performed using a high intensity 24 GeV/c proton beam. Over one year, the total accumulated particle fluence exceeds $1e18$ p/cm², which represents a challenge for the beam monitoring instrumentation. During the 2014-2018 run, PCBs patterned with a matrix of sensing pixels were used as Secondary Electron Emission (SEE) Beam Profile Monitors (BPMs). To improve their radiation tolerance, a EU-funded R&D project (ATTRACT NanoRadMet) is ongoing, to manufacture new BPMs by sputtering and evaporation of metal films at the nanometer scale. The reduction in metal thickness minimizes the beam interaction and opens the possibility to monitor also low-energy charged beams such as the ones used in medical applications. We report here about the fabrication of different BPM prototypes, made of Aluminium deposited on Silicon and Polyimide substrates, and their characterization with a 200 MeV electron beam at the CERN CLEAR facility.

Funding information

European Union ATTRACT project

Primary authors: MATEU, Isidre (CERN); RAVOTTI, Federico (CERN); PEZZULLO, Giuseppe (CERN); MESKOVA, Viktoria (Democritus University of Thrace (GR)); GKOTSE, Blerina (Mines ParisTech (FR)); GILARDI, Antonio (Universita e sezione INFN di Napoli (IT)); FARABOLINI, Wilfrid (Université Paris-Saclay (FR)); Prof. SALLESE, Jean-Michel (Ecole Polytechnique Federale de Lausanne); Mr BOUVET, Didier (Ecole Polytechnique Federale de Lausanne); Prof. RITALA, Mikko (University of Helsinki)

Session Classification: Technology Transfer

Track Classification: Technology Transfer