

## Gain suppression studies on IMB-CNM LGAD detectors

Wednesday, 12 November 2025 09:00 (16 minutes)

Low Gain Avalanche Detectors (LGADs) have recently emerged as key sensors for precise timing measurements, enabling accurate tracking of charged particles and photons in High Energy Physics (HEP) experiments and beyond. The time resolution is closely linked to the detector's gain, with a direct correlation between gain stability and timing precision. In turn, the gain of LGADs depends on the nature of the particle being detected, since both the ionization density and the depth at which the charge is generated within the active volume influence the multiplication process, a phenomenon known as gain suppression. This contribution presents gain suppression studies performed on LGAD detectors fabricated at IMB-CNM, employing Ion Beam Induced Current (IBIC) measurements with a focused 2.3 MeV proton microbeam at different incidence angles. The analysis provides direct insight into the spatial dependence of charge multiplication and highlights the sensitivity of LGAD performance to different ionization density profiles.

### Type of presentation (in-person/online)

online presentation (zoom)

### Type of presentation (I. scientific results or II. project proposal)

I. Presentation on scientific results

**Author:** VILLEGAS DOMINGUEZ, Jairo Antonio (Consejo Superior de Investigaciones Cientificas (CSIC) (ES))

**Co-authors:** Ms TORRES, Carmen (Centro Nacional de Aceleradores (CNA)); GARCIA LOPEZ, FRANCISCO JAVIER; Mr DOUGADOS, Florent (Instituto de Microelectrónica de Barcelona (IMB-CNM)); Dr JIMENEZ RAMOS, Maria Del Carmen (Universidad de Sevilla (ES)); Mr RODRIGUEZ-RAMOS, Mauricio (Centro Nacional de Aceleradores (CNA)); FERNANDEZ-MARTINEZ, Pablo (IMB-CNM, CSIC); Dr HIDALGO, Salvador (Instituto de Microelectronica de Barcelona (IMB-CNM-CSIC))

**Presenter:** VILLEGAS DOMINGUEZ, Jairo Antonio (Consejo Superior de Investigaciones Cientificas (CSIC) (ES))

**Session Classification:** Joint WG2-WG3