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Status of the Cryogenic AntiCoincidence detector for ATHENA X-IFU: DM and SM models

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The study of the X-ray sky, in particular transient sources, is an important part of the multimessenger astrophysics concurrent to Gravitational Waves and Neutrino Observations. It helps to understand different phenomena, e.g. the central engine and jet physics in compact binary mergers, the equation of state of neutron stars, cosmic accelerators, and the origin of Cosmic Rays (CRs), the Cosmic distance scale and tests of General Relativity and the Standard Model. Athena (Advanced Telescope for High ENergy Astrophysics) will be an X-ray telescope mounted on a satellite that will be launched in 2030 decade towards an L1 orbit. One of the two detectors mounted on the focal plane will be a cryogenic spectrometer (X-ray Integral Field Unit, X-IFU) to perform high resolution spectroscopy and imaging. To reduce the particle induced background, thus enhancing the X-IFU sensitivity, a Cryogenic Anti-Coincidence detector (CryoAC) is planned. It consists of a hexagonal 4-pixel silicon microcalorimeter sensed by Ir/Au TES network that will work as veto system. A demonstration model (DM) having square active area of 1 cm2 has been developed and tested showing that it is fully compliant with its requirements. Further, a structural model (SM) of final form has been developed and tested for mechanical and thermal stress. Here we report the CryoAC general status and in particular the results of the DM and SM tests.

Primary author: GALLUCCI, Giovanni (Istituto Nazionale di Fisica Nucleare)

Presenter: GALLUCCI, Giovanni (Istituto Nazionale di Fisica Nucleare)

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