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R&D activities of the FAZIA upgrade in Korea

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FAZIA (Forward A and Z Identification Array) is designed to identify charges and masses of reaction products from heavy-ion collisions from a few tens of MeV to about a hundred MeV per nucleon.
One basic unit of FAZIA consists of 4 x 4 shaped, three-layered telescopes.
The first and second layers are silicon sensors with different thicknesses of 300 um and 500 um, respectively, and one CsI scintillator detector read out by a photodiode follows at last.
The FAZIA detector identifies nuclei up to Z ˜ 52 in charges and Z ˜ 25 in masses and has been running successfully at GANIL since 2019.

The FAZIA upgrade project has started to cover a higher beam-energy range and increase the acceptance capability.
The Korean FAZIA team is working on the research and development of silicon sensors and the improvement of the front-end electronics board.
In particular, TCAD (Technology Computer Aided Design) simulation tool has been used to calculate the expected physical features of the silicon sensors, such as electric field and current density.
Based on the simulation result, our prototype of sensor designs was optimized and has been fabricated recently in collaboration with a domestic fab.

We will present the research and development activities conducted by the Korean FAZIA team in the upgrade project and show the fabricated sensor's measured properties, including the I-V curve and detector response respected to a radiation source.

Theory / experiment

Experiment

Group or collaboration name

FAZIA collaboration

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