

AGATA – status, perspectives for installation in Poland and possible physics case

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AGATA (Advanced GAMMA Tracking Array) is the biggest project concerning R&D on nuclear radiation detectors pursued in recent years in Europe. Its objective is to build and to operate a 4π gamma ray spectrometer made of 180 HPGe segmented crystals capable to detect photons with unprecedented efficiency and sensitive to the impact position. Due to extensive cost and demanding HPGe crystal production technology the detector is implemented in phases. In 2009 the AGATA Demonstrator (AD) consisting of 15 HPGe crystals was installed in the LNL laboratory in Italy to prove the detection concept in-beam. AD was also used at LNL to perform first physical experiments. Since then, the array has been gradually complemented with new detectors and used in experimental campaigns in the European laboratories as at GSI in Germany (2012-2014) and now at GANIL in France, currently AGATA includes 45 crystals (1π). It is planned that in the forthcoming decade the project will be completed and will serve the European nuclear physics community to perform high precision gamma spectroscopy experiments. The most challenging programs presume the use of radioactive ion beams at GANIL- SPIRAL, LNL- SPES and GSI/FAIR - NUSTAR.

From the very beginning Poland participates in the AGATA project. We have developed some components of the array electronics and its ancillary particle detectors which are mandatory to increase the overall sensitivity of AGATA. Our groups have proposed and performed experiments in the AGATA host laboratories and contributed to the array operation costs.

The installation of the high current heavy-ion cyclotron in Warsaw and setting up a group competent in the detector maintenance and development could place HIL among the competing European accelerator laboratories that could apply to be a host of the AGATA array.

In the talk I will summarize the current status of the AGATA project and describe its further development. I will present ideas on the possible use of the array at HIL, especially in experiments aimed at high spin spectroscopy of very deformed nuclides from the $A=40-70$ mass region and the very heavy transfermium nuclei.