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KRAB detector for the ASY-EOS II experiment

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First results of the tests of the newly constructed KRAB detector will be presented. The tests have been performed with the Bi source, cosmic rays and with the proton beams from the CCB cyclotron in Krakow. The detector was designed to provide fast, multiplicity based trigger for the future ASY-EOS II experiment as well as the information on the azimuthal distributions of the reaction products and on the centrality of the collision. The experiment is aimed to provide new constraints on the stiffness of the nuclear Equation of State based on the analysis of the neutron and proton flows.

KRAB consists of 736 plastic scintillating fiber segments distributed in 5 rings and read out by silicon photomultipliers. It was successfully commissioned in May 2022. The detector is equipped with the helium sleeve enclosing the remotely controlled target wheel, FPGA based trigger box and CITIROC based front end electronics. The sleeve is supposed to reduce the background caused by the delta-electrons. The wheel has 4 target slots.

The detector is fully operational, 100% of channels work. Generation of the trigger takes about 50 ns. To complete the tests and provide optimal settings for the electronic channels a heavy ion beam test is needed and is foreseen to be performed at GSI, Germany or at HIMAC, Japan in the near future.

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