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SPIDER: a new particle detector for Coulomb excitation measurements

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The science of exotic nuclei is a vast and very active field of research and facilities to produce radioactive ion beams (RIB) are under construction in many countries.

Low-energy Coulomb excitation is one of the simplest and well known tools to study the properties of low-lying excited levels of atomic nuclei. For this reason is widely used at radioactive beam facilities: in particular in the case of ISOL facilities the energy and the intensity of the first available beams is suitable for safe-energy Coulomb Excitation.

In a near future the SPES facility will provide the first exotic beams at the National Laboratories in Legnaro. At the same time the AGATA array will be likely installed at LNL.

To this aim the gamma spectroscopy group of Florence have developed and assembled an apparatus to be used at the SPES facility. It consists of up to 8 sector shaped silicon detectors (aperture angle about 45 degrees) arranged in a pie shape. Each sector is segmented into eight independent annular strips on the front surface. This Silicon Pie DETector (SPIDER) will provide a clean trigger to an array of germanium detectors (like GALILEO or AGATA) allowing the development of the Coulomb excitation technique at LNL.

The first commissioning experiment with SPIDER coupled with the GALILEO gamma ray spectrometer will be performed and hopefully will be followed by a Coulomb excitation experimental campaign with stable beams. In this talk details about the detector, simulations and recent tests at the LABEC laboratory in Florence will be shown.

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