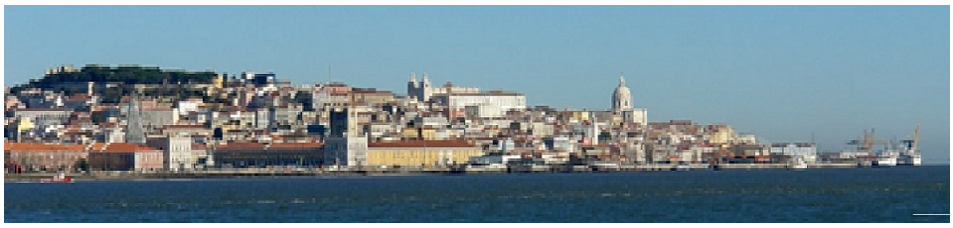

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PARIS - Photon Array for Studies with Radioactive Ion and Stable beams

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Radioactive ion beam facilities, which are being under development, as SPIRAL2, SPES, HIE-ISOLDE, and therefore EURISOL DF, need adequate novel experimental detection systems. The proposed Photon Array for Studies with Radioactive Ion and Stable Beams (PARIS) is being developed to work in these facilities. PARIS is a large array of phoswich detectors expected to measure γ rays over a wide range of energy from few hundred keV to 40 MeV. It is envisaged to serve the dual purpose of a high-energy gamma-ray spectrometer and a spin-spectrometer, capable of determining the multiplicity of low energy (100 keV to few MeV) discrete γ rays associated with a specific reaction. Upon completion PARIS is envisaged to be an array of 216 phoswich detectors. The front section of each phoswich detectors is a cubic (2x2x2) Lanthanum Bromide crystal optically coupled to a 6 long square bar of NaI(Tl) of matching cross section. Each of these detectors is to be read by a single photomultiplier tube (PMT) of 2”diameter that would allow close packing of such detectors. It is planned to combine 9 phoswich detectors in a square (3x3) close packed geometry forming a single cluster [1-4].

The project is to be executed in a phased manner with the completion of one cluster in the first phase (PARIS prototype) and five clusters by the end of the second phase (PARIS demonstrator). The third phase will see the completion of 12 clusters. In its final configuration, commissioned by the end of the fourth phase, PARIS is envisaged to have clusters covering 4π solid angle around the target. A variety of experiments in nuclear structure and reaction dynamics are foreseen to be pursued with PARIS using both stable and radioactive ion beams. The various physics cases include studies of giant dipole resonances (GDR) in excited nuclei, exotic shape-phase transitions, Coulomb excitation, heavy ion radiative capture, reaction dynamics around and above the barrier etc.

In the poster the main idea of PARIS concept will be described, together with information on the PARIS clusters use in the first experiments, as well as planned use of PARIS in EURISOL-DF facilities.

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