

Abstract Submitted  
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**Summing NaI(Tl) detector (SuN) for radioactive beam experiments relevant for the p-process** ANNA SIMON, ILYA BESKIN, SEAN LIDDICK, KARTHIK PADMANABHAN, JESSICA PEACE, STEPHEN QUINN, ARTEMIS SPYROU, BENJAMIN STEFANEK, NSCL/MSU — P-process refers to  $(\gamma, p)$ ,  $(\gamma, \alpha)$  and  $(\gamma, n)$  reactions producing nuclei on the neutron-deficient side of the valley of stability that cannot be reached by s- and r-processes. This process can be investigated via inversed reactions, i.e. proton or alpha capture with gamma emission. Gamma spectra resulting from capture reactions, may be complicated in structure and as such difficult to analyze. However, this difficulty may be omitted by implementing a summing technique, for which all gamma rays emitted during the decay cascade are summed into one peak, so called “sum peak.” Thus, in ideal case, the resulting spectrum will comprise of one peak of the energy  $E=E_{cm}+Q$ . This technique has already been successfully tested during stable beam experiments. In order to apply this technique to radioactive beam experiments a new Summing NaI(Tl) (SuN) detector was designed at NSCL. It is a 16x16 inch cylindrical barrel divided into eight optically separated segments, each of them read by three photomultipliers. Each of the PMTs is read independently by a digital data acquisition system (DDAS) and the final sum spectrum is obtained by software summing of the individual spectra. Here, first results obtained with the SuN detector as well as its possible future applications will be presented.

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