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C.Y. Wu, J.A. Becker, D. Cline

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C.Y. Wu and J.A. Becker
Lawrence Livermore National Laboratory, Livermore, CA 94550
D. Cline
Department of Physics, University of Rochester, Rochester, NY 14627

Bambino is a charge-particle detector system with the capability to provide a sufficient energy and position resolution for recoiling nuclei with $Z \leq 20$ for the Doppler-shift corrections necessary to maintain the γ-ray resolution in TIGRESS. It consists of two annular silicon detectors having an active inner diameter of 22 mm and outer diameter of 70 mm and a thickness of 140 μm. They will be placed 3 cm from the target and provide solid-angle coverage of 1.15π sr. It has 24 sectors in θ each for the angle coverage between from 20.1^o to 49.4^o and from 130.6^o to 159.9^o and 16 sectors in ϕ for 360^0 coverage. Three of those detectors have been ordered from Micron Semiconductor Ltd. and two were received so far. A split spherical target chamber will be built in Rochester to accommodate this detector system. The detector signals will travel through the custom-designed vacuum feedthrough and conversion board before reaching the preamplifier.

The custom-made preamplifier has 8 channels in each unit with a gain of 10 mV/MeV. Ten of these have been ordered from Swan Research. They will be mechanically mounted on both the entrance and exit beam pipes to minimize the distance between the detector and preamplifier. All the electronics have been ordered and should arrive before the Labor Day 2005. A general-use vacuum chamber has been ordered from Kurt J. Lesker Company for checking this detector system and should arrive in early August 2005. Bambino will be ready for experiments in conjunction with TIGRESS by the spring 2006 and available for all TIGRESS collaborators.

The initial phase of proposed experiments will be to study, but not exclusively, the issue of the "island of inversion" for the Mg isotopes in the $N \approx 20$ region. The $B(E2)$ values for the first 2^+ states of ^{30,32,34}Mg have been measured using intermediate-energy Coulomb excitation at projectile fragmentation facilities. The $B(E2)$ value for ^{30}Mg also was measured recently via conventional Coulomb excitation at the CERN REX-ISOLDE facility. The spread in measured B($E2$)'s up to a factor of two is insufficient to distinguish among various shell model predictions. More precise measurements are necessary to ascertain how well the shell model can predict the properties of neutron-rich nuclei. An accuracy about 5% for the measured B(E2) can be achieved assuming a three-day beam time with an intensity about 3×10^4 p/s of ^{32}Mg on a 3 mg/cm^2 ^{208}Pb target at E_{lab}=115 MeV. A measure of the shape or the static quadrupole moment of this nucleus, in addition to the B(E2) value, is possible if the beam intensity were above 10^6 p/s.

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