Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Search for the isovector monopole resonance via the ^{28}Si(^{10}Be,^{10}B+γ)^{28}Al reaction[1] MICHAEL SCOTT, MSU physics / NSCL, FOR THE E11021 COLLABORATION TEAM — The isovector giant monopole resonance (IVGMR) is a fundamental mode of collective oscillation in which the neutron and proton fluids in a nucleus radially expand and contract in an out-of-phase manner. Observation of the IVGMR has been difficult due to the lack of a probe that will excite only its non-spin-flip ($\Delta S = 0$) transitions. The IVGMR's spin-transfer ($\Delta S = 1$) counterpart, the isovector spin giant monopole resonance, is much more strongly excited at bombarding energies higher than 60 MeV/u. By way of the (^{10}Be,^{10}B+γ) charge-exchange reaction, the selectivity for the excitation of the IVGMR can be gained. In this probe, the superallowed Fermi transition ^{10}Be(0^+,g.s.)$\rightarrow$^{10}B(0^+_1,1.74 MeV,$T = 1$) allows a nearly pure isolation of the $\Delta S = 0$ component by detecting the 1022 keV gamma rays from the deexcitation of the ^{10}B. We measured the double differential cross sections for the ^{28}Si(^{10}Be,^{10}B+γ) reaction at 100 MeV/u using the large acceptance S800 Spectrometer at the National Superconducting Cyclotron Laboratory with the GRETINA array detecting the gamma rays emitted from the ^{10}B ejectile. In this presentation, we will report preliminary reults of the IVGMR in ^{28}Al.

[1]GRETINA was funded by the US DOE - Office of Science. Operation of the array at NSCL is supported by NSF under Cooperative Agreement PHY-1102511(NSCL) and DOE under grant DE-AC02-05CH11231(LBNL).

Michael Scott
MSU physics / NSCL

Date submitted: 01 Jul 2013 Electronic form version 1.4