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Nuclear Structure Between N=20 and N=28: Beta-Decay in the Neutron-Rich Mg and Al Isotopes[1] HEATHER CRAWFORD, Lawrence Berkeley National Laboratory, NSCL EXPERIMENT E14063 TEAM — The structure of nuclei in the vicinity of expected nuclear shell closures away from stability has been, and continues to be, a cornerstone for nuclear structure study. The confirmation of certain "magic numbers" in exotic nuclei provides insight into the evolution of nucleon configurations with isospin, but perhaps even more light is shed into the structure of the atomic nucleus when expected shell closures are found to be weakened, or entirely disappear. Two instances where this has been the case are the N=20 and N=28 neutron shell closures in the neutron-rich Mg, Si and S nuclei. However, a question which is only beginning to be answered is the nature of the transitional nuclei between N=20 and 28. Recent experimental work in the Mg isotopes has suggested a chain of prolate-deformed nuclei at Z=12, but the nature of the Al and Si isotopes just above remains a question. An experiment was conducted at NSCL to study the β-decay of neutron-rich Na, Mg, Al and Si isotopes to provide additional, and in some cases, first information on the level structures of the daughter isotopes in the region between N=20 and N=28. First results from this work will be presented, and the implications for nuclear structural evolution in this region discussed.

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