The development of single-nucleon pickup reactions with fast, exotic beams as a spectroscopic tool\textsuperscript{1} S. MCDANIEL, A. GADE, P. ALDRICH, D. BAZIN, J.M. COOK, C. AA. DIGET, NSCL, Michigan State University, K.W. KEMPER, Department of Physics, Florida State University, T. GLASMACHER, A. RATKIEWICZ, K. SIWEK, NSCL, Michigan State University, J.A. TOSTEVIN, Department of Physics, University of Surrey, UK, D. WEISSHAAR, NSCL, Michigan State University — One-nucleon knockout reactions are an established tool to track the evolution of nuclear shell structure away from stability by probing single-hole states. Currently, fast-beam, heavy-ion induced pickup reactions are being developed that provide, in a similar way, the complementary structure information by probing single-particle states. At the NSCL, several proton and neutron pickup reactions centered around the proton-rich isotope $^{50}$Fe were investigated: $^9$Be($^{49}$Mn,$^{50}$Fe)X, $^9$Be($^{50}$Fe,$^{51}$Fe)X, and $^9$Be($^{48}$Cr,$^{49}$Mn)X. Information from these reactions, including the effects of target variation ($^9$Be versus $^{12}$C), will help develop the one-nucleon pickup reaction into a tool for nuclear structure physicists.

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