Abstract Submitted
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The 2-Body Photodisintegration Reaction ^{4}He(γ,n)^{3}He below 30 MeV[1] J.H. KELLEY, NCState/TUNL, R. RAUT, G. RUSEV, S.C. STAVE, A.P. TONCHEV, W. TORNOW, Duke Univ./TUNL — The charge-symmetric reactions ^{4}He(γ,p)^{3}H and ^{4}He(γ,n)^{3}He are of special interest in few-body physics. Although they have been studied for half a century, the data for these classical breakup reactions scatter widely. For the ^{4}He(γ,n)^{3}He reaction case, it is advantageous to detect the ^{3}He particles rather than the associated neutrons. The most recent approach used a time-projection chamber [1] for the ^{3}He detection, but these data disagree considerably from those obtained via neutron detection [2]. In an attempt to clarify the situation, we measured the cross section of the ^{4}He(γ,3He)n 2-body breakup reaction below Eγ=30 MeV at TUNL's HIGS facility using high-pressure ^{4}He/Xe gas scintillators of various composition ratios. The challenge in this approach is to separate the pulses from the low-energy ^{3}He ions, which are not mono-energetic, from those produced by Compton scattered electrons at the low pulse-height side and those from the ^{4}He(γ,p)^{3}H reaction at the high pulse-height side. First results will be compared to existing data and theoretical calculations. [1] T. Shima *et al.*, Phys. Rev. C **72**, 044004 (2005). [2] B. Nilsson *et al.*, Phys. Rev. C **75**, 014007 (2007).

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John Kelley
NC State

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