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**Neutron Production via a Pyroelectric Crystal without a Tip** W. TORNOW, Duke University & TUNL, S.M. SHAFROTH, University of North Carolina at Chapel Hill, J.D. BROWNRIDGE, Binghamton University — Recently, Naranjo et al.<sup>1</sup> and Geuther et al.<sup>2</sup> reported on the production of neutrons via the  ${}^2\text{H}(\text{d},\text{n}){}^3\text{He}$  reaction using a pyroelectric crystal with a tungsten tip attached. Here we report that neutrons can also be produced with a simpler version. Our accelerator consisted of a 2.54 cm dia x 2.54 cm  $\text{LiTaO}_3$  crystal placed in  $\text{D}_2$  gas of 2 mTorr without a tip and without a deuterated foil. The  $\text{D}_2$  provided the projectiles and target atoms for the  ${}^2\text{H}(\text{d},\text{n}){}^3\text{He}$  reaction. When the heated (by a Peltier heater/cooler) crystal was allowed to cool to room temperature, our 12.5 cm dia x 5 cm liquid scintillator based neutron detector equipped with neutron-gamma-ray pulse-shape discrimination electronics counted 6 neutrons per minute compared to a background rate of 2 events per minute. The neutron detector was shielded by about 6 mm of Pb from the very intense X-ray radiation ( $\sim 100$  mR/h). The maximum ion energy and current were 200 keV and 3 nA, respectively. When  $\text{H}_2$  was substituted for  $\text{D}_2$ , no neutron counts above background were detected. <sup>1</sup>B. Naranjo, J.K. Gimzewski, and S. Putterman, *Nature* 434, 115 (2005) <sup>2</sup>J. Geuther, Y. Danon, and F. Saglime, *Phy. Rev. Lett.* 96, 054803 (2006)

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Prefer Oral Session  
 Prefer Poster Session

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