Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Deuterated-xylene (EJ301D): A new, improved deuterated scintillator for neutron spectroscopy[1] FRED BECCHETTI, RAMON TORRES-ISEA, Dept. Physics, U. Michigan, Ann Arbor MI 48109, MICHAEL FEBBRARO, Oak Ridge National Lab, Oak Ridge TN 37831, SHAUN CLARKE, ANGELA DI FULVIO, SARA POZZI, Nucl.Eng.Rad.Sci. Dept., U. Michigan, Ann Arbor MI 48109 — In conjunction with Eljen Technologies (Sweetwater,TX), we have developed and evaluated a deuterated-xylene based liquid organic scintillator detector (3 in. x 3 in.) and PMT assembly. Like deuterated-benzene based scintillators such as EJ315 and NE230 the n+d recoil spectrum producing the light spectrum has distinct peaks corresponding to specific neutron energy groups. The light spectrum can then be unfolded to produce neutron energy spectra including fission spectra without the need for time-of-flight. This results in a large over-all detection efficiency for such detectors as they can be used in arrays covering a large angular range, close to the neutron source and do not require a pulsed or gated source. In addition, the new EJ301D scintillator has a lower neutron energy threshold for improved PSD, which is important in many low-energy measurements. More importantly this scintillator has a much safer flash point than benzene-based scintillators making it better suited for many applications including field applications in nuclear security and non-proliferation.

[1]Work supported in part by US NSF and by the Consortium for Verification Technology under Department of Energy National Nuclear Security Administration award number DE-NA0002534.

Fred Becchetti
Dept. Physics, U. Michigan Ann Arbor MI 48109

Date submitted: 30 Jun 2015 Electronic form version 1.4