

Abstract Submitted  
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**Pulse shape discrimination with new single crystal organic scintillators**<sup>1</sup> JASON NEWBY, NATALIA ZAITSEVA, STEPHEN PAYNE, NERINE CHEREPY, LESLIE CARMAN, Lawrence Livermore National Laboratory, GIULIA HULL — Pulse shape discrimination in organic single crystal and liquid scintillators provides a means of identifying fission energy neutrons with high specificity. We present the results of a broad survey of over one hundred single crystal organic scintillators produced from low-temperature solution growth technique. Each crystal was evaluated for light yield and pulse shape discrimination performance. The pulse shape dependence on excitations via a Compton electron from a gamma and a recoil proton from a fast neutron was measured using full waveform digitization. Several groups of compounds were compared in relation to molecular and crystallographic structures, crystal perfection, and the effect of impurities. New prospective materials offering neutron/gamma discrimination comparable or superior to stilbene will be presented. We also report on the growth of large single crystal lithium salicylate and other promising Li compounds which have sensitivity to lower energy neutrons via neutron capture on  ${}^6\text{Li}$  and are separable from other excitations via pulse shape discrimination.

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