Scintillation Performance of Sr co-doped Cs₂LiYCl₆:Ce Crystals from -35 to 180°C
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Introduction
We previously shown that the gamma-only Core-Valence-Luminescence (CVL) in Cs₂LiYCl₆:Ce (CLYC:Ce) decreases with increasing temperature and becomes undetectable above 125°C [1,2]. We have also demonstrated that it is possible to use a temperature-dependent algorithm scheme to perform pulse shape discrimination (PSD) up to 180°C by analyzing the long decay component [2]. In this study, Sr co-doping has been introduced into CLYC:Ce crystal to further improve its PSD performance at room and high temperatures.

Luminescence Centers in CLYC

Pulse Shape Discrimination

Scintillation Properties

Summary and Outlook

Sr co-doping does not show any effect on the light output and energy resolution of CLYC:Ce.
Sr co-doping appears to promote the formation of a secondary Ce center in CLYC:Ce.
Sr in CLYC:Ce, Sr decreases with temperature and disappears at ~150°C, which is ~25°C higher than that of Ce only CLYC.
Future work will focus on further improving the high temperature performance of CLYC by co-doping.

REFERENCES
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