Investigation on Ce doped Lu(Y)3Al5O12 single crystal fibers grown by laser heated pedestal growth method

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Scintillation single crystal fibers have great potential applications in the new generation of high-energy ray and particle detectors due to their morphological advantages. In this work; Ce:LuAG, Ce:YAG and LuYAG（with various compounds) single crystal fibers were grown along the direction of [111] by laser heated pedestal growth (LHPG) method [1-3]. The results of analyzing the absorption spectra; radio luminescence (RL) spectra; pulse-height spectra and fluorescence lifetime of single crystal fibers show that the they maintain excellent scintillation performance while having a fiber structure. Meanwhile, Three methods were designed to investigate longitudinal distribution of cerium element and the light response uniformity of scintillation single crystal fibers. It indicated that Ce doped Lu(Y)3Al5O12 single crystal fibers are potential candidate materials for detector.

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