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Comparative study of GdLu2Al2Ga3O12:Ce and GdY2Al2Ga3O12:Ce scintillation crystals for γ - ray detection

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The scintillation characteristics of Czochralski –grown GdLu2Al2Ga3O12:Ce and GdY2Al2Ga3O12:Ce single crystals were compared for γ - ray detection. At 662 keV γ - rays, light yield (LY) of 33,900 ph/MeV and energy resolution of 14.3% obtained for GdLu2Al2Ga3O12:Ce are inferior to those of 37,500 ph/MeV and 10.6% obtained for GdY2Al2Ga3O12:Ce. Scintillation decays were measured using the time-correlated single photon counting technique. A fast component decay time of 48 ns with relative intensity of 71% obtained for GdLu2Al2Ga3O12:Ce is superior to that of 106 ns (57%) for GdY2Al2Ga3O12:Ce. The coincidence time resolution were measured in reference to a fast BaF2 scintillator and discussed in terms of a number of photoelectrons and decay time of the fast component.

Has accepted

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