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Study of GAGG scintillation crystals for X-ray scanners with energy resolved counting

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The modern trend in developing of the transmission x-ray scanners based on fast scintillators and SiPMs arrays combining gamma pulses counting and amplitude selection methods. Such scanners can be very attractive for medical imaging and human/luggage inspection. These applications require commercially available, cheap scintillators with high brightness, high density, good linearity and energy resolution. Additional important requirements are fast decay time and a low contribution from an afterglow. A one possible candidate for such application is interesting new scintillator material Gadolinium Aluminium Gallium Garnet doped by Ce–GAGG (Ce) crystals. The comparative study of several different GAGG(Ce) crystals from Japan C&A Corporation and Russian firm Fomos Materials have been tested with different photosensors and their linearity, energy resolution and photokinetics have been measured. The requirements for selection of the best crystals for X-ray transmission scanners will be formulated and results presented.

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