

# INVESTIGATION OF LUMINESCENCE QUANTUM YIELD IN GAGG:CE AND LYSO:CE SCINTILLATION CRYSTALS

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Since their discovery scintillators have been used to detect high energy particles. Throughout last few decades the research and development was mainly driven by demand of scintillator with higher light yield and faster luminescence rise and decay times. These two qualities affect energy resolution and maximum number of measurable events, both of which are important for high energy physics experiments and medical applications such as positron emission tomography.

In this work the influence of co-doping on quantum yield of GAGG:Ce and LYSO:Ce scintillators<sup>4</sup> was investigated. Photoluminescence excited by various energy photons was measured and quantum yield value was evaluated using an integrating sphere method. It was evidenced that quantum yield of GAGG:Ce scintillator is affected by Mg co-doping only when photoexcited carries can escape to the conduction band of host matrix (fig. 1). The increased amount of Ce<sup>4+</sup> luminescence centers after co-doping LYSO:Ce with calcium resulted in a two-fold decrease of quantum yield value.

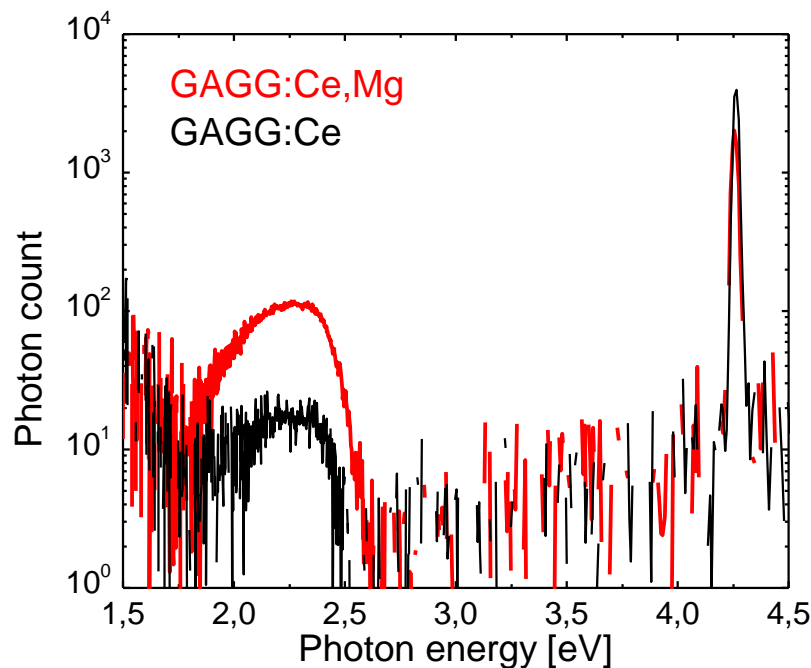


Fig. 1. Photoluminescence spectra of GAGG:Ce (black) and GAGG:Ce co-doped with Mg (red)