The Comparison of Energy Resolution Fitting Functions for 1.5″ NaI:Tl, CsI:Tl, $LaBr_3$:Ce, and $CeBr_3$ Scintillation Detectors

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Abstract. Thallium doped sodium iodide scintillation detector is the most widely used scintillation detector in gamma spectrometry. Unfortunately, sodium iodide reaches insufficient energy resolution for many applications. This fact has led manufacturers to develop scintillators with better energy resolution such as $Labr_3$:Ce and $CeBr_3$. The energy resolution of $Labr_3$:Ce is about 3 times better and the resolution of $CeBr_3$ is about 2 times better than the resolution of NaI:Tl. On the other hand, the production cost is still a disadvantage of these newer scintillators. The paper deals with energy resolution functions comparison of the 1.5 inch NaI:Tl, CsI:Tl, $LaBr_3$:Ce, and $CeBr_3$ scintillation detectors. The measurements and analysis to find the best fitting functions for energy resolution were performed.