

## A Study on the Portable Nuclear Survey System with Imaging Capability

Wanno Lee, Gyuseong Cho, Kwang Hyun Kim and \*Ho Dong Kim

KAIST

373-1 Kusong-Dong, Yusong-Gu, Teajon, 305-701 Korea

\*KAERI

P.O Box 135, Yusong-Gu, Teajon, 305-600 Korea

### Abstract

A portable gamma camera that has been developed for the radiation monitoring in nuclear facilities is composed of a combined CCD (Charge-Coupled Devices) and a gamma imaging system that produces accurate two-dimensional images by the gamma ray of emitting from objects through the superimposition of visible image. This system can quickly determine the location and measure the radioactivity of radiation source from long distance because it produces real-time color of gamma ray image and a conventional black and white CCD picture. The ability to operate at a safe distances from source is essential practical nuclear survey such as high level radiation field and other application where significant dose savings is needed. In this paper, a prototype gamma camera system has been developed and tested for the characteristic analysis at laboratory as well as at other area having high-level radiation field. Through preliminary test for producing image from gamma ray sources with the energies between 140 keV and 662 keV, this developed prototype system be shown that spatial resolution defined as a function of FWHM (Full With Half Maximum) is 9.6 mm with intrinsic efficiency of 2.7 % at a distance of 5 cm source, 10  $\mu\text{Ci}$   $^{137}\text{Cs}$ .