Contribution ID: **29** Type: **Oral**

Simulation of Micro-metal Detection with Backscattered X-ray

Friday, November 8, 2024 5:55 AM (10 minutes)

Backscattered X-ray imaging is a nondestructive inspection that uses X-rays scattered backward from an object.
Compared to X-ray transmission imaging, backscattered X-ray imaging has the advantage that the source and detector can be placed on the same side of the object. It is currently used to inspect thick objects and structures.
Although material decomposition methods using X-ray energy information have been proposed, X-ray image and CT images are not effective for small objects such as thin films. Imaging requires a high magnification rate, which imposes strong constraints on the size of the object and the imaging system.
Therefore, we propose a method to detect target micro-metals from materials composed of miscellaneous elements by spectral analysis of backscattered X-rays. In this paper, using the PHITS , particle and heavy ion transport code, the detection of backscattered X-rays from a subject with a PCB(Printed Circuit Board)-like structure using a CdTe detector was simulated. The subject is a layered structure consisting of tin, noble meta, copper, and glass epoxy. Spectra obtained from each of the individual elements, from the complete subject, and from the subject with noble metals excluded were compared and analyzed. The results suggest the possibility of using X-ray fluorescence to detect small objects and a future material decomposition methods in backscattered X-ray imaging.

Type of presence

Presence online

Primary author: HAYASHI, Kohei (Shizuoka University)

Co-authors: KASE, Hiroki (Shizuoka University); Mr TAKAGI, Katsuyuki (Shizuoka University, ANSeeN Inc.); Prof. AOKI, Toru (Shizuoka University, ANSeeN Inc.)

Presenter: HAYASHI, Kohei (Shizuoka University)

Session Classification: Imaging Techniques, CT Imaging, and Augmented Reality