

# Identification of composite material using CT imaging

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Many of the various products in the world are composed of multiple materials. For example, snacks such as chocolate are sold packed in plastic or paper, and smartphone charging cables have metal power lines covered with nylon. These products can be distinguished by the eyes, but some composite materials cannot.

In X-ray imaging by photon counting using a CT system, X-rays pass through the subject, and directly converted into electrical signals, then projected as an image. Since the energy information of each X-ray is counted during direct conversion, the energy characteristics of the photographed object can be collected. Therefore, it has the advantage of being able to perform material discrimination using that.

In this study, the goal is to identify composite materials that are similar in composition and shape using CT imaging. At first, we imaged a section of the target composite material with a 150kV CT device, reconstructed, and displayed as image data in DICOM format. After adjusting the window width, we were able to capture each of the materials that make up the composite to some extent. Then same imaging was performed in 14 energy bands with thresholds from 10 keV to 150 keV in 10 keV increments, and we compared the reconstructed images.

## Type of presence

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**Primary author:** TAKEMOTO, Shunsuke (Shizuoka Univ.)

**Co-authors:** KASE, Hiroki (Shizuoka University); NISHIZAWA, Junichi; TAKAGI, Katsuyuki; AOKI, Toru (Shizuoka University)

**Presenter:** TAKEMOTO, Shunsuke (Shizuoka Univ.)

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