Identification of buried objects using energy distribution of backscattered X-rays

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In recent years, as it has become possible to detect buried objects using X-rays, there is a need to detect landmines buried underground and to inspect the aging of reinforcing bars in aging buildings. This research uses a method called backscatter X-ray inspection, which irradiates an object with X-rays and detects what is reflected. Backscattered X-ray inspection can detect objects regardless of their size or distance, making it possible to perform X-ray inspections when the distance or size of objects such as underground objects is unknown.

The purpose of this research is to identify buried objects based on the differences in backscattered X-ray spectra emitted depending on the material, shape, and distance of the object. This time, we analyzed backscattered X-rays, including complex scattering and absorption within materials, and verified angle-dependent changes in scattered X-ray spectra depending on the material of buried objects. In this study, we evaluated the scattering angle of X-rays from 0° to 90° when X-rays are applied to an object through measurement and verification. From the experimental results, we were able to detect scattered X-rays and characteristic X-rays that are characteristic of each material and detect angle-dependent changes. However, the incident X-rays and backscatter X-rays were scattered in a complicated manner, and the detected It was difficult to determine the material and shape of the subject from the image.

Topics

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