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Identification of buried objects using energy distribution of reflected X-rays.

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In recent years, the ability of X-rays to detect buried objects has led to calls for the detection of land mines buried underground and the inspection of aging reinforcing steel bars in aging buildings. In this study, A method called reflection x-ray imaging is used, in which X-rays are irradiated onto a target and the reflected X-rays are detected. Reflected X-ray imaging can detect objects regardless of their size and distance, and is expected to enable X-ray imaging in cases where the distance to an object, such as an underground object, and its size are unknown.

The purpose of this study is to identify buried objects by the difference of reflected X-ray spectra depending on the material, shape, and distance of the object. Reflected X-rays including complex scattering and absorption within the material were analyzed, and angle-dependent changes in the scattered X-ray spectrum due to the material of the buried object were verified. Measurements and verification were made to evaluate X-rays for the angles they scatter from 0° to 180° when they are applied to a target. Result showed that reflected and characteristic X-rays characteristic of each material could be detected, and that angle-dependent changes could be detected, but Complex scattering of incident and reflected X-rays., and it was difficult to determine the material and shape of the target from the detected X-rays. In future research, Reflected X-rays are analyzed for object identification using artificial intelligence.

Topics

Session C. Applied optics and engineering

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