

Angular dependence of back scatter spectrum

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Today, X-ray imaging is applied in the medical, industrial, and security fields.

In the transmission image of X-ray imaging, a detector must be placed on the opposite side of the X-ray source across the subject, which limits the size of the subject that can be captured due to the distance between the X-ray source and the detector. In backscatter X-ray imaging, on the other hand, the X-ray source and detector are placed on the same side to detect scattered X-rays. This method is considered able to detect objects regardless of their size.

The angular dependence of the scattered X-ray spectrum is expected to change depending on the shape of the object. In addition, it is necessary to verify whether the angular dependence of the scattered X-ray spectrum changes depending on the material of the object. Therefore, the purpose of this study is to discriminate the angular dependence of the scattered X-ray spectrum and to identify the material and shape of a material from the reflection angle and spectrum of scattered X-rays.

In this report, we performed Monte Carlo simulations to evaluate the fraction of X-ray photons scattered for each angle of scattering from 0° to 180° when a pencil beam is applied to an object.

Topics

Session D. Biomedical optics and sensors technology

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