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Developing an imaging instrument using a small neutron source.

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This study is about to developing an imaging instrument using a small neutron source. X-ray penetration image and neutron penetration image have a complementary relationship. The neutron penetration imaging has advantage of structural analysis of materials containing light elements than X-ray penetration imaging, and it can image interior of thick metals due to its very high transmission capability. Currently, all the neutron facilities are large in size. Some of neutron sources are more than 1 km in length, but there is no table-top neutron facility that can be used in a small size. Therefore, the principle verification of the system has been designed and the elemental technology was carried out to develop a neutron penetration imaging device. In order to develop the instrument, design for safety has verified, and then designed the instrument for imaging. Then, the effects on neutron shielding and scattering were simulated. After that, as a proof of principle for the elemental technology, hydrogen plasma generation was confirmed that will lead to the experiment of actual generation of neutrons.

Topics

Session D. Biomedical optics and sensors technology

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