

Why use neutrons? An Overview of Neutron Imaging and Neutron Sources

Monday, 9 September 2013 13:30 (30 minutes)

Why use neutrons? An Overview of Neutron Imaging and Neutron Sources

Contrary to X-rays, thermal neutrons react not with the electron shell of atoms, but with the nuclei themselves. Huge contrast may appear even among isotopes of the same element. Neutrons react very sensitive to Hydrogen, while penetrating most metals easily; this makes neutron imaging a complementary tool to X-ray imaging, often showing the opposite contrast.

A few elements like Cadmium and Gadolinium show such high contrast that they can be used as contrast agents in liquid form to detect tiny cracks and hollows.

The downside of neutron imaging is that neutrons are not as easily obtained as X-rays –large facilities such as nuclear reactors or accelerators are required to obtain neutron radiation in intensities comparable to common X-ray sources.

The talk will give an introduction about the properties of neutrons and neutron imaging as well as scientific neutron sources.

Primary author: SCHILLINGER, Burkhard

Co-authors: Mr BAUSENWEIN, Dominik (TUM/FRM2 ANTARES); SCHULZ, Michael; Mr REIMANN, Tommy (FRM II)

Presenter: SCHILLINGER, Burkhard

Session Classification: Neutron Imaging I

Track Classification: NINMACH