Neutron tomography at IPEN-CNEN/SP: images and applications

Reynaldo Pugliesi[1], Marco Antonio Stanojev Pereira[1], Marcos Leandro Garcia Andrade[1]

[1]INSTITUTO DE PESQUISAS ENERGÉTICAS E NUCLEARES

e-mail: pugliesi@ipen.br

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Reynaldo Pugliesi; Marco A.S.Pereira; Marcos L.G.Andrade

Instituto de Pesquisas Energéticas e Nucleares IPEN-CNEN/SP

pugliesi@ipen.br

The neutron tomography is a non destructive testing technique used to inspect the internal structure of a sample by means of tridimensional digital images. Because of the neutron-matter interaction characteristics this technique can be used to inspect hydrogen-rich substances like ceramics, oil, grease, water, rubber, blood and others, even wrapped by thick metal layers. In this way, the information provided by neutrons are complementary to the ones provided by X-rays. The Brazilian Institute for Nuclear Technology IPEN-CNEN/SP has an equipment for neutron tomography which since Nov/2011 is operational and installed at the IEA-R1 Nuclear Research Reactor. This equipment is able to provide high quality tomographs and some important results obtained for Proton Exchange Membranes (PEM) cell, for an archaeological sample and for pottery, will be presented. Furthermore, details of its construction and its versatility, in the sense that by means of small adjustments is possible to obtain images by other neutron imaging techniques, will be also presented. Is very important enhance that the high quality of the obtained images is due to the excellence of the IEA-R1 reactor which is able to furnish neutron beams with adequate intensity for such purpose.

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