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Primary experiments and inspections of materials using new NR beamline at the TRR

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Neutron radiography is a powerful technique for non-destructive testing of materials for industrial application and research. This technique is complementary to X-ray radiography and finds unique applications in quality assurance of nuclear fuel and investigation of cultural heritage objects. A new neutron radiography beam line has recently been built at Tehran Research Reactor in order to expand the application of neutron radiography. In this work, some experiments and inspections of various samples like fuel rods, a cultural heritage sample and some flowers are done. In the qualitative investigations of fuel rods, the difference in size and enrichment between the pellets and the gaps between them were obviously recognized in the neutron radiographic image. In the quantitative investigations, data of the pellets compositions, their sizes (lengths and diameters) and the gaps between them were extracted from obtained images. In the neutron radiographic image of the rose, the structure of the pedicel and the layered petals are well visible.

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