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A New Method for Detecting Trace Oil Concentration by Neutron Radiography Technique

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Modern Neutron Imaging (NI) facility in the ETRR-2 provided precise information for detection of trace oil concentration in cultural heritage treasures. The presence of high scattered oil materials distorted the neutron radiography quantitative measurements and caused blurred images.

This work presented a new technique in precise quantitative measurement and calibration. The technique was based on the scattering correction of images. The correction was not based on the Monte Carlo (MCNP) code simulations, but rather on a real case scattering correction by a designed code. Also, the distinction of this work was showing a real free scattered image that was not performed before.

The designed code possesses an extensive set of algorithms for digital image processing. The code has arithmetic menu commands performing versatile operations between images. The installation of excellent neutron imaging (NI) system at the research reactor in Egypt increased the reliance on appropriate software for advanced imaging processing and data analysis. The code provided up-to-date high quality images by designing formula commands supported by all standard mathematical functions. This open source code was used for detection and measurement of trace oil concentration by the neutron radiography (NR) technique.

Country/Organization invited to participate

Egypt

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