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Neutron Imaging Application in Food Science on DINGO at OPAL

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The new neutron radiography / tomography / imaging instrument DINGO [1] is operational since October 2014 to support research at ANSTO. It is designed for a broad national and international scientific user community and for routine quality control for defense, industrial, cultural heritage and archaeology applications. With experience from materials science and archeology we would like to connect to the field of food science application. DINGO provides a useful tool to give a different insight into objects because of different contrast compared to X-rays and high sensitivity to light elements. Since being operational we gathered experience in various scientific fields, with industrial applications and commercial customers demanding beam time on DINGO. The measured flux (using gold foil) for an L/D of approximately 500 at HB-2 is 5.3 x 107 [n/cm2s] allows us to run neutron tomography experiments in a reasonable time scale from 3hours to 3days per tomography, depending on sample composition and resolution. A special feature of DINGO is the in-pile collimator position in front of the main shutter at HB-2. The collimator offers two pinholes with a possible L/D of 500 and 1000. A secondary collimator separates the two beams by blocking one beam and positions another aperture for the other beam. The neutron beam size can be adjusted to the sample size from 25 x 25 mm2 to 200 x 200 mm2 with a resulting pixel size from 13µm to ~100µm. The whole instrument operates in two different positions, one for high resolution and one for high speed. We would like to present example experiments with potential new applications in food science.

[1] Garbe, U; Randall, T; Hughes, C; Davidson, G; Pangelis, S and Kennedy, SJ (2015), A New Neutron Radiography / Tomography / Imaging Station DINGO at OPAL, Physics Procedia 69, 27-32.

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