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Neutron Imaging Facility DINGO targetting new fields of research with high resolution upgrade

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The new neutron radiography / tomography / imaging instrument DINGO 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 defence, industrial, cultural heritage and archaeology applications. In the field of industrial application it provides a useful tool for studying cracking and defects in concrete or other structural material. 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], which is in a similar range to other facilities. 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 and positions another aperture for the other beam. The neutron beam size can be adjusted to the sample size from 50 x 50 mm2 to 200 x 200 mm2 with a resulting pixel size from 10µm to ~100µm. First results on 3D-printed functional ceramics tomography and porosity analysis on carbon fibre object will be preseted. A further upgrade available begin of next year will deliver a pixel size of 2-3µm wit a custom made lens camera setup in combination with an isotope enriched Gadox scintillation screen. In addition we will present an outlook into a real neutron microscope magnifying the neutron image with magnetic lenses targeting the sub micron area. This new imaging instrument concept is a potential candidate for a second guide hall planned at ANSTO.

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