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Comparative study: X-ray and neutron CT on a mummified votive offering

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This study involved investigation of an unusual Egyptian votive mummy (IA.2402) of unknown age and provenance, generously loaned by the Australian Institute of Archaeology (AIA) in Melbourne, Australia. The AIA was interested to learn more about the authenticity and contents of the mummified bundle, while preserving the physical integrity of the object and causing as little damage as possible. The application of 3D imaging techniques was ideal to non-destructively study the object and still discover as much as possible about its contents. Using a combination of established and novel techniques: X-ray computed tomography (CT) and neutron CT provided valuable insight, both individually and collectively, revealing a partial animal skeleton, and several layers of textile and padding. Use of both techniques allowed for complementary study of bones, soft tissue, and textile components. Collaboration with a zooarchaeologist confirmed the animal remains to be a small, juvenile feline. Neutron CT, not yet routinely applied to archaeometric studies of mummified remains, provided insight into wrapping techniques used in the mummification process of votive animal offerings. In addition to these imaging studies, pigment analysis was also performed on the coloured markings on the wrappings. This was done using a scanning electron microscope (SEM) and Raman spectroscopy in order to determine their composition, and to verify their authenticity. Radiocarbon dates were acquired on samples taken from the external wrapping and the internal contents, revealing an age discrepancy between the two. This as a result is an example of recycling votive offerings, and sheds some light on the economic and religious climate in which the mummy was made and traded.

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