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Type: Poster

The IMPACT of phase-contrast on lung CT imaging

X-ray computed tomography (CT) is a common diagnostic tool for lung cancer, the leading cause of cancer-related deaths in Australia. Clinical CTs derive contrast from differences in the attenuation of X-rays by various biological tissues, meaning there is poor contrast seen from the weakly-attenuating lungs. Novel X-ray phase-contrast imaging techniques, currently best realised at a synchrotron, offer significantly improved contrast at low radiation dose [1], and are particularly suited to the lungs [2]. Propagation-based phase-contrast CT imaging (PB-CT) has recently been shown to significantly improve image quality in human-scale porcine models of lung cancer [3]. A \$5 million Synergy grant was awarded in 2022 to a large group of collaborators in Australia and overseas for the ‘IMPACT’ project, with the aim of bringing PB-CT to clinical implementation. As the clinical mammography part of that project starts working with patients, a parallel project is focusing on the lungs, investigating viability and developing protocols for future clinical trials. We present the first lung data, gathered in August 2022 at the Imaging and Medical Beamline (IMBL) of the Australian Synchrotron, using a human chest model with realistic lung and lung cancer analogues, and describe challenges and future directions.

- [1] Kitchen, M. J. et al. Sci Rep 7, 15953 (2017).
- [2] Yagi, N., et al., Medical physics 26, 2190-2193 (1999).
- [3] Wagner, W. L. et al. J Synchrotron Rad 25, 1827–1832 (2018).

Level of Expertise

Student

Presenter Gender

Man

Pronouns

He/Him

Do you intend to attend UM2022

In person - Melbourne

Students Only - if available would you be interested in student travel funding

Yes

Students Only –Do you wish to take part in the Student Poster Slam

No

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Yes

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