Contribution ID: 7 Type: Poster

The progression of MIST: Multimodal Intrinsic Speckle-Tracking

Speckle-based phase-contrast X-ray imaging (SB-PCXI) is capable of reconstructing sample information below the imaging system's spatial resolution. Since its realisation in 2012 [1,2], there has been significant development in the experimental implementation and theoretical formalism of SB-PCXI. We have been investigating how the concept of "local energy conservation"can be used to reconstruct various signals from a sample- an approach termed Multimodal Intrinsic Speckle-Tracking (MIST). MIST combines the Fokker-Planck description of paraxial X-ray propagation [3] with a geometric-flow formalism for speckle-tracking [4] to consider both coherent and diffusive effects. We have developed several approaches in the quest to solve the SB-PCXI inverse problem [5-8]. This involves reconstructing quantitative and qualitative sample information from detector-measured intensity SB-PCXI data. Initial attempts to solve this inverse problem considered only the coherent channel of energy-flow, from which an algorithm to reconstruct a sample's projected-thickness was derived [5]. We currently present an algorithm capable of reconstructing the directional diffusive scattering signal from unresolved-microstructure [8]. This presentation will focus on the development of MIST, future research directions, as well as the wider application of SB-PCXI as a viable imaging technique.

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Level of Expertise

Student

Presenter Gender

Woman

Pronouns

She/Her

Do you intend to attend UM2022

In person - Melbourne

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Primary author: ALLOO, Samantha (School of Physical and Chemical Sciences, University of Canterbury, New Zealand)

Co-authors: PAGANIN, David (School of Physics and Astronomy, Monash University); MORGAN, Kaye (Monash University); Dr PAVLOV, Konstantin (School of Physical and Chemical Sciences, University of Canterbury, New Zealand)

Presenter: ALLOO, Samantha (School of Physical and Chemical Sciences, University of Canterbury, New Zealand)

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