



## Coherent X-ray Diffractive Imaging Simulated by Monte Carlo Ray-Tracing

Fevola, Giovanni; Bergbäck Knudsen, Erik; Ramos, Tiago; Carbone, Gerardina; Andreasen, Jens Wenzel

*Publication date:*  
2019

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Fevola, G., Bergbäck Knudsen, E., Ramos, T., Carbone, G., & Andreasen, J. W. (2019). *Coherent X-ray Diffractive Imaging Simulated by Monte Carlo Ray-Tracing*. Abstract from 4th International Congress on 3D Materials Science (3DMS 2018), Helsingør, Denmark.

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

### **Coherent X-ray Diffractive Imaging Simulated by Monte Carlo Ray-Tracing**

Giovanni Fevola, Erik Bergbäck Knudsen, Tiago Ramos, Gerardina Carbone, Jens Wenzel Andreasen

Coherent diffractive imaging (CDI) techniques have gained significant momentum in recent years, and most synchrotrons have dedicated beamlines for CDI techniques, with full-field CDI and ptychography (near-field and far-field) among the most commonly applied. Tomographic ptychography combines a large field of view with the capability to image structures in 3D down to about 10 nm in resolution.

Simulations of CDI experiments can assist in interpretation of data by regularization of 3D reconstruction to help distinguish signal from noise, or to design experiments that minimize X-ray dose. Several factors are however hampering simulations in a ray-tracing framework, and so far only simplified test-cases have been reported.

In this talk, we detail novel enhanced CDI features of the ray-tracing software McXtrace <sup>1</sup>, and discuss their ability to produce ptychographical datasets.

1. Bergbäck Knudsen, E. *et al.*, *J. Appl. Crystallogr.* **46**, 679–696 (2013).

Field Code Changed

Formatted: English (United States)