

Publication

An intelligent peak search program for digital electron diffraction images of 3D nano-crystals

Conference Paper (Artikel, die in Tagungsbänden erschienen sind)**ID** 4530991**Author(s)** Jiang, Linhua; Georgieva, Dilyana; IJspeert, Kim; Abrahams, Jan Pieter**Author(s) at UniBasel** [Abrahams, Jan Pieter](#) ;**Year** 2009**Title** An intelligent peak search program for digital electron diffraction images of 3D nano-crystals**Editor(s)** Qiu, Peihua; Yiu, Cedric; Zhang, Hua; Wen, Xianbin**Book title (Conference Proceedings)** 2009 2nd International Congress on Image and Signal Processing**Place of Conference** Tianjin, China**Publisher** IEEE**Pages** 1-5**ISSN/ISBN** 978-1-4244-4129-7 ; 978-1-4244-4131-0**Mesh terms** Social SciencesScience & TechnologyTechnologyPhysical SciencesCOMMUNICATION-COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONSCHEMISTRY MULTIDISCIPLINARYPHYSICS MULTIDISCIPLINARYCOMPUTER SCIENCE HARDWARE ARCHITECTURECOMPUTER SCIENCE SOFTWARE ENGINEERINGCommunicationComputer ScienceChemistryPhysics

Electron diffractograms are lattice images of crystalline samples taken in transmission electron microscopy for molecular structure determination studies. Electron diffraction is a technique widely used in material science and recently it is gaining significance also in life science for studying 2D and 3D organic crystals. However, often the images suffer from strong background noise, masking the data points. Moreover, they suffer also from the strong center beam exposure or a big beam-stop which covers a lot of useful information. This paper presents a user-friendly peak search program in which an autocorrelation algorithm is utilized creatively to intensify the signal and to center the image in the particular regular lattice. An adaptive background removal algorithm is designed to remove the central beam and to reduce the background noise. The latter algorithm can be used for a wide range of applications, such as 2D spectral analysis in physics, NMR Analysis, stars recognition of aerospace photographs.

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