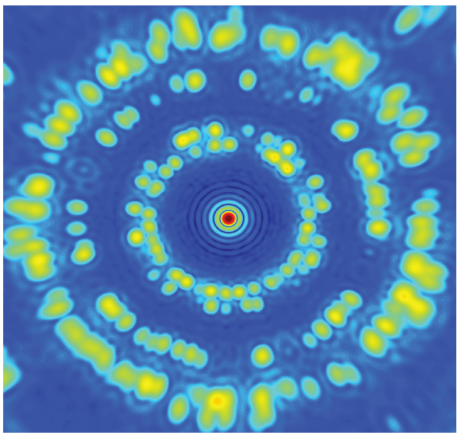
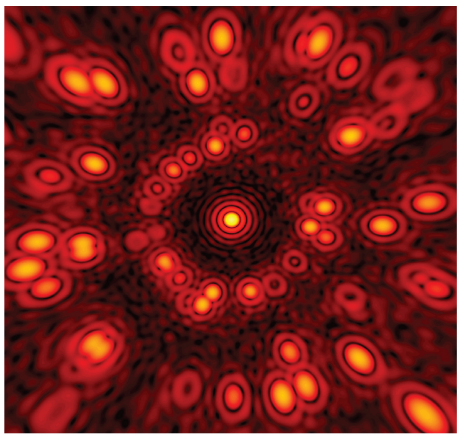
I. Cevdet Noyan

Bragg Selection Rules for a Nanoparticle Diffraction Experiment



100-plus years of theoretical and experimental advances have reduced kinematical scattering formalisms for powder diffraction to routine, vendor-supplied, black-box analysis programs accessible to users at all training levels. Understanding what really goes on in the analysis, however, is a non-trivial task. We used computer modeling to analyze the powder diffraction process from nanoparticle ensembles. Our results showed, surprisingly, that the classical formulations described in diffraction textbooks were inadequate; venerable concepts like reflection multiplicity, the “Lorentz factor”, sampling statistics, etc. actually depended on the size of the crystalline particles contributing to the diffraction profile. We expect modeling of scattering experiments to yield more surprises as the phase space hidden behind canonical assumptions becomes accessible for exploration.

I. Cevdet Noyan has been working on diffraction and related phenomena for over 30 years. He obtained his Ph.D. from Northwestern University in 1984 and joined the IBM Research Division in Yorktown Heights in 1985. In 2004 he joined the Applied Physics and Applied Mathematics Department of the School of Engineering and Applied Science at Columbia University, where he is currently serving as Department Chair. He is the author of more than 150 publications, holds 20 patents, and is a Fellow of the American Physical Society.



Wednesday, November 4, 2015 | 3:00 p.m.

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