

ADVANCEMENT IN X-RAY WAVEGUIDES AND THEIR APPLICATIONS IN COHERENT DIFFRACTION IMAGING

D. Pelliccia^{1*}, **C. Giannini**², **L. De Caro**², **A. Cedola**³, **I. Bukreeva**³, and **S. Lagomarsino**³

¹ *Institut für Synchrotronstrahlung – ANKA Forschungszentrum Karlsruhe
Herman-von-Helmholtz-Platz 1, D-76344 Eggenstein-Leopoldshafen, Germany*

² *Istituto di Cristallografia - CNR, Via Amendola 122/O, 70126 Bari, Italy*

³ *Istituto di Fotonica e Nanotecnologie - CNR, Via Cineto Romano 42, 00156 Roma, Italy*

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**) e-mail: daniele.pelliccia@iss.fzk.de*

X-ray planar waveguides are currently used tools, in synchrotron radiation facilities, to produce a coherent beam with dimension of nanometer size. The properties of waveguided beams such as divergence and coherence will be reviewed for different coupling methods of the radiation field with the waveguide channel. Results obtained with both synchrotron radiation and laboratory source will be presented.

Due to the high degree of coherence of the exiting beam, x-ray waveguides can be successfully exploited in Coherent Diffraction Imaging experiments. We present results concerning Fresnel coherent diffraction imaging experiments with hard x-rays, using planar waveguides as optical elements in one and two dimensions. This method offers a route for fast and reliable phase retrieval in x-ray coherent diffraction.

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