

Off-axis Electron Holography at the TEAM I microscope

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ABSTRACT

Aberration correctors have enabled electron microscopy to analyze materials with true atomic resolution. Unfortunately, TEM intensity images always suffer from a partly loss of the object phase shift, which contains valuable information about the sample. Off-axis electron holography is an interferometric technique which allows analyzing the complete complex electron wave hence can reveal the missing object information. Therefore, it has become a useful microscopy tool for quantitative phase contrast imaging [1].

The last decade has brought huge instrumental improvements in the field of electron microscopy. The TEAM project [2] has gained a lot of attention for being one the largest projects in this field. Its final outcome, the TEAM I microscope, incorporates a number of powerful technological advances, including a CC/CS corrector [3], a piezoceramic stage [4] and a direct electron detector [5]. It is of great interest to utilize off-axis electron holography in the TEAM I microscope since there are several areas where electron holography substantially benefits from these instrumental advances. Therefore, the TEAM I column has been equipped with an electron biprism for holographic experiments.

This talk will provide an overview of TEAM I's capabilities and the related improvements for offaxis electron holography. It turns out that the TEAM I environment is especially useful for recording high-quality atomic-resolution electron holography at low-voltages. [6]

References

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