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Ultra-high spatial resolution in micron scale achieved by a practical cascade high-energy electron radiography in HERPL

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As a new scheme, High Energy Electron Radiography (HEER) was considered as one of the novel mesoscale diagnostic methods for high energy density matter (HEDM) because of powerful penetration, high space-time resolution and large density dynamic diagnosis range. In this work, we R&D a practical cascade HEER composed of a electromagnetic beamline and a permanent magnet HEER in High Energy Electron Radiography Research Platform in Lanzhou (HERPL). The field of view of the cascade HEER is about $\Phi 3\text{mm}$, and its total length is half that of the electromagnetic HEER with the same magnification. 50 MeV electron beams with picosecond pulse width bunch were used to image a TEM grid to study the spatial resolution. The excellent result was obtained with spatial resolution about $0.6\ \mu\text{m}$. In addition, electron bunch train and ultra-fast imaging acquisition system prepared for dynamic HEER were studied in this paper.

Footnotes

Paper preparation format

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