

Initial Results from the Transmission Grating Spectrometer

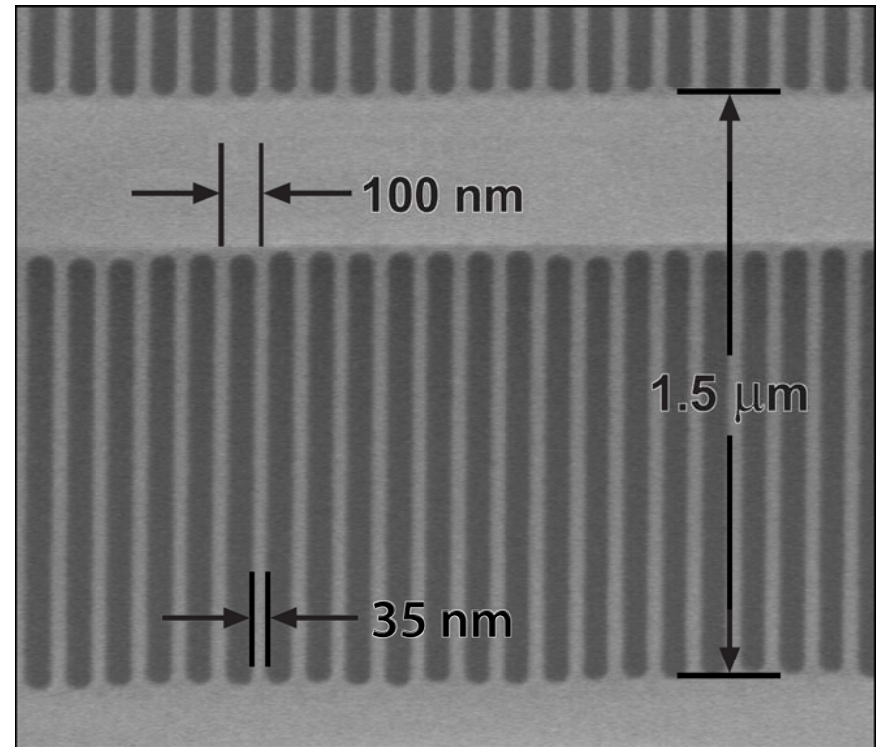
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Transmission Grating Provides SXR/VUV Dispersion $\sim 1\text{-}30\text{nm}$

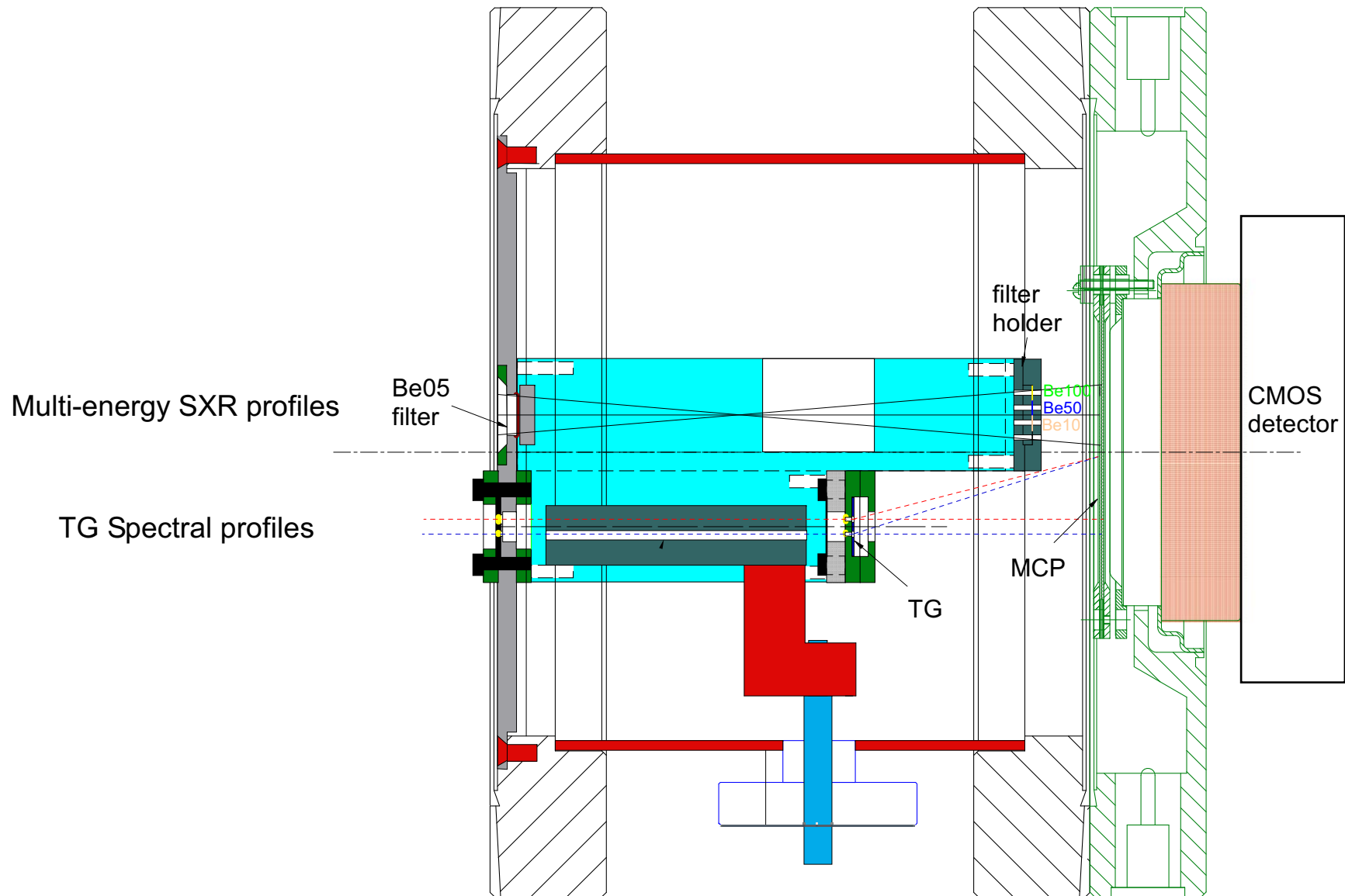
Grating Specifications:

- Material: SiN_x
- Period: 100 nm
- Bar Width: 35 nm
- Support Structure Period: 1.5 μm

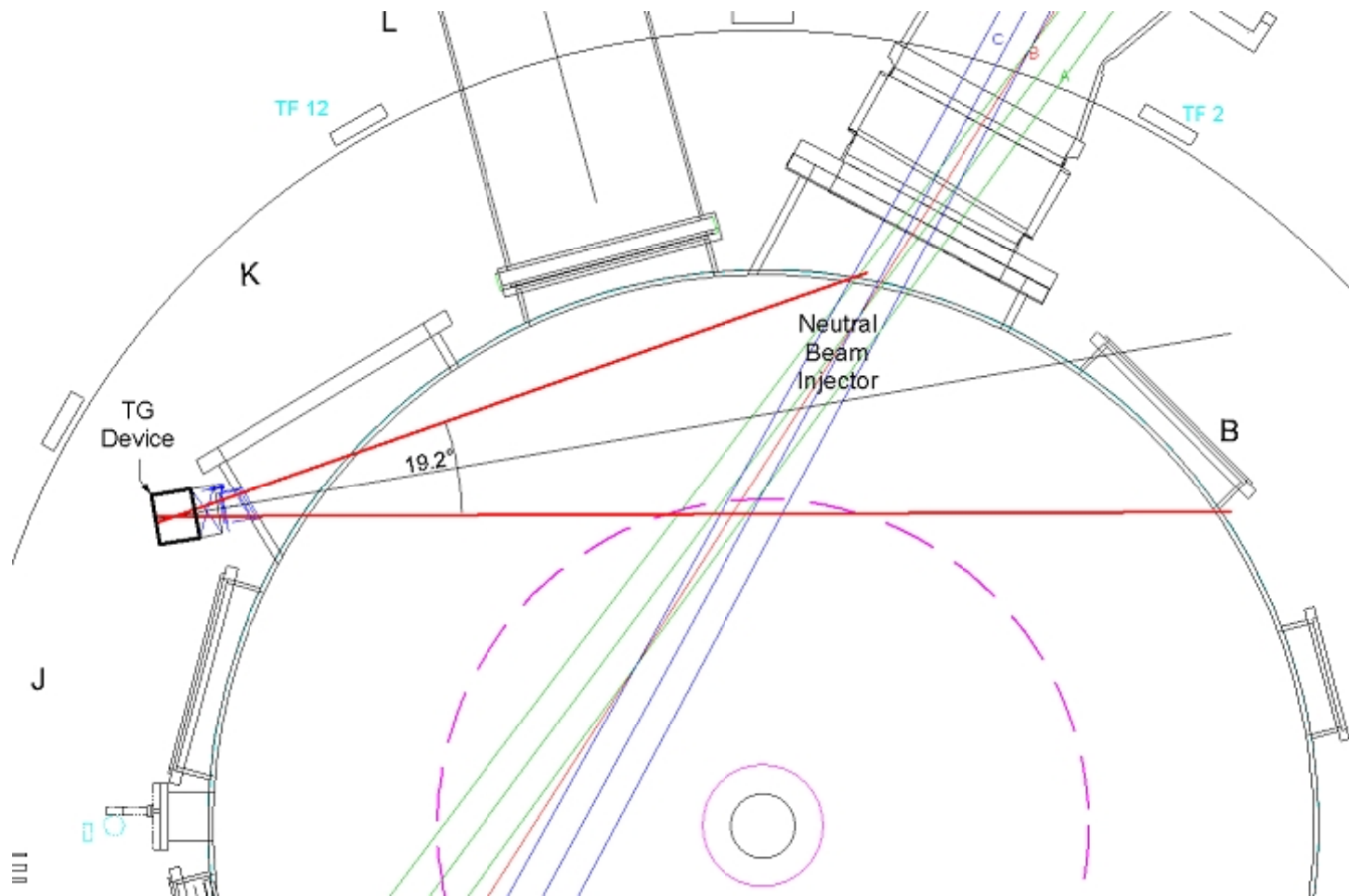


Combined with pinhole, TG provides spatially resolved spectra from $\sim 1\text{-}30\text{nm}$

Hybrid Camera Schematic

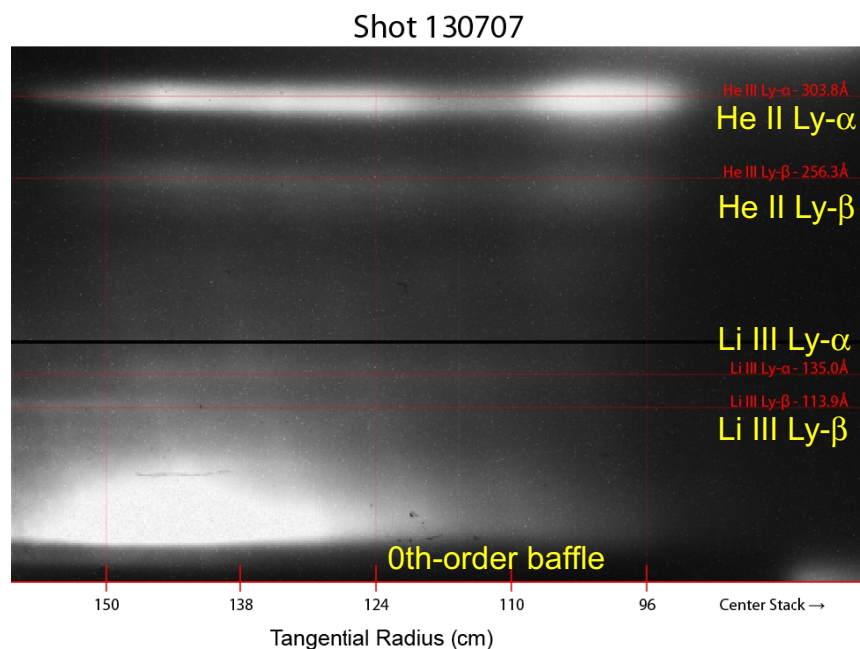


TG Machine Placement and Field of View

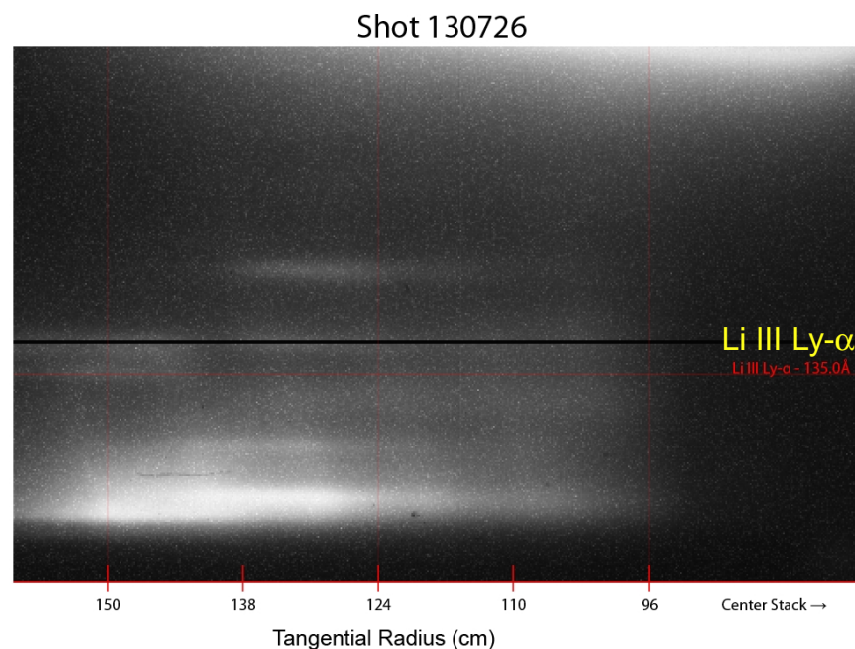


Designed to view beam emission from edge to plasma core

Initial Results Show Several Identifiable Spectral Lines



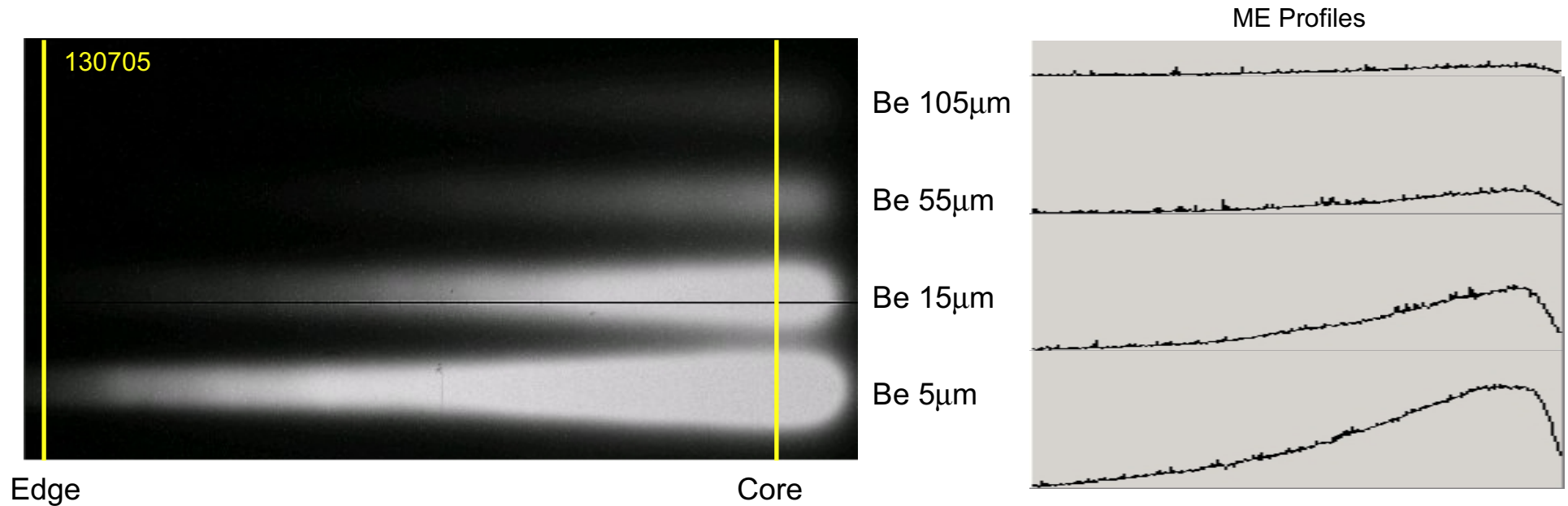
He discharge with NBI heating



D discharge with NBI heating

- Present detector integrates over shot
- Lithium measurement/monitoring important for upcoming LLD
- Helium emission useful for particle transport measurements
- Lower wavelength emission from metals presently blocked by 0th-order baffle

Multi-Energy SXR Profiles Similar to tOSXR Array



Future Plans

- Faster detector for time resolved spectra ($\sim 50\text{ms}$)
- Higher efficiency grating
- Move multi-energy capability to separate diagnostic
- Improved 0th order baffle for measurement of high-Z impurities