

Experimental Setup of Apodization Techniques for Beam Diagnostics Performed at ELBE

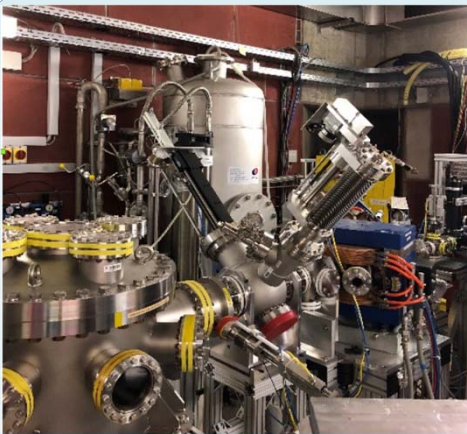
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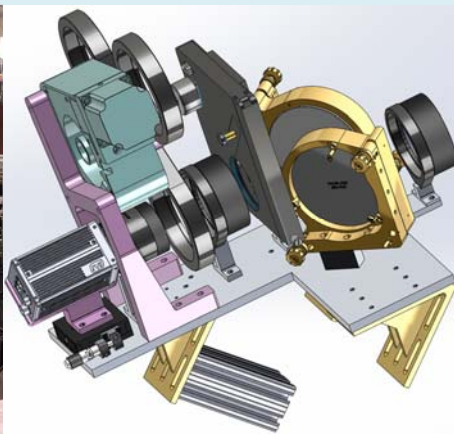
ABSTRACT

The ELBE (Electron Linac for beams with high Brilliance and low Emittance) facility in Dresden, Germany is a multipurpose user facility, which is also used for accelerator R&D purposes. The beam line was setup for transverse beam profile measurements, where the imaging system includes a series of three apodizers and five circular apertures. Both of which could be changed remotely during beam operation, through automated LabVIEW routines. The bunch structure and charge were varied to collect a series of images that were acquired automatically, and then stored for later analysis. Over 12,000 images were captured and then analyzed using software written at Jefferson Lab that runs ImageJ as its main image processing library.

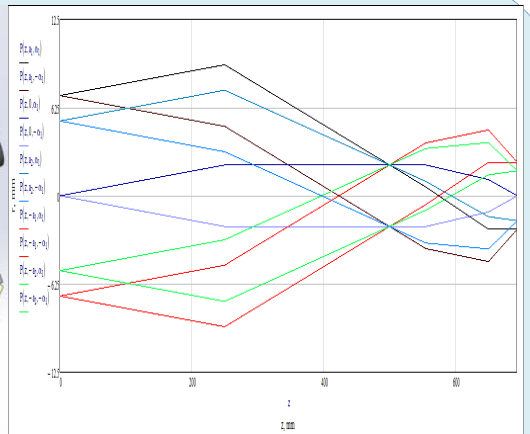
Work supported by DOE Contract DE-AC05-06OR23177 and by BES Early Career Research Grant



Large Dynamic Range Diagnostic Station (LDRDS) as positioned at ELBE.



CAD drawing of the optical setup.



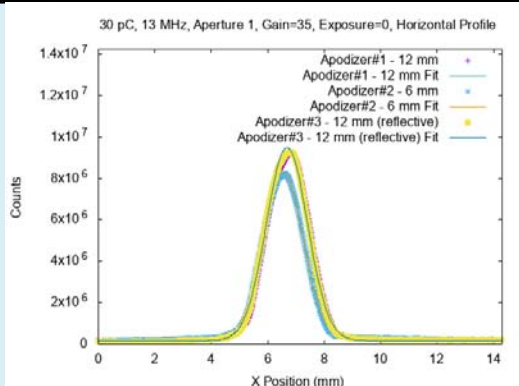
Raytrace of the optical imaging system.



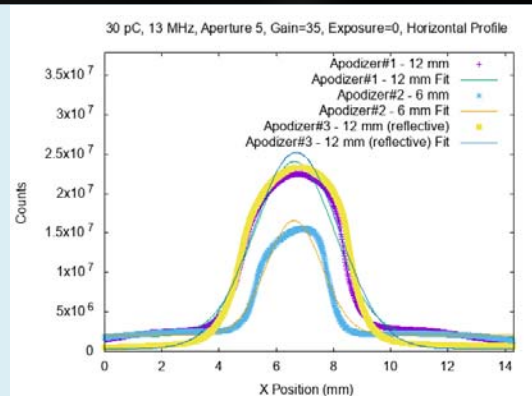
Apodizers



LabVIEW Interface



Plot & image of Aperture #1 (1 degree of angular acceptance), all three apodizers.



Plot & image of Aperture #5 (5 degree of angular acceptance), all three apodizers.