

The Brookhaven LINAC Isotope Production Facility (BLIP) Raster Scanning Upgrade*

R. Michnoff, Z. Altinbas, P. Cerniglia, R. Connolly, C. Cullen, C. Degen, D. Gassner, R. Hulsart, R. Lambiase, L. Mausner, D. Raparia, P. Thieberger, M. Wilinski

Collider-Accelerator Department, Brookhaven National Laboratory, Upton NY 11973, USA

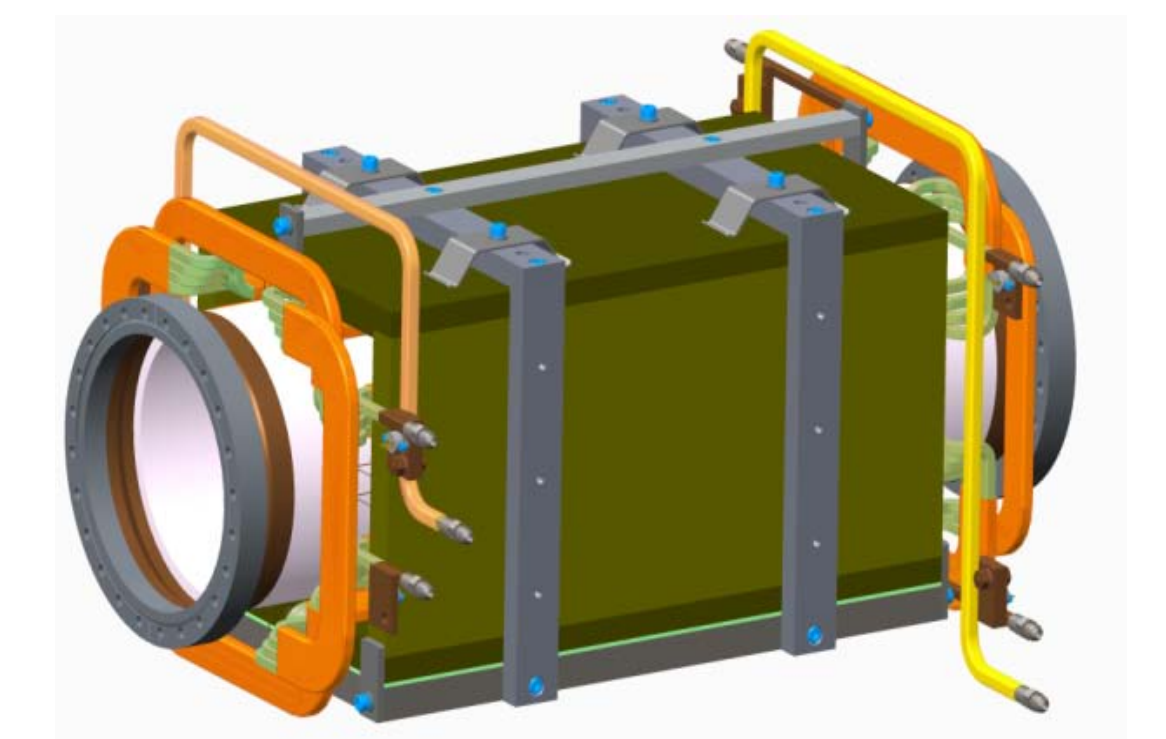
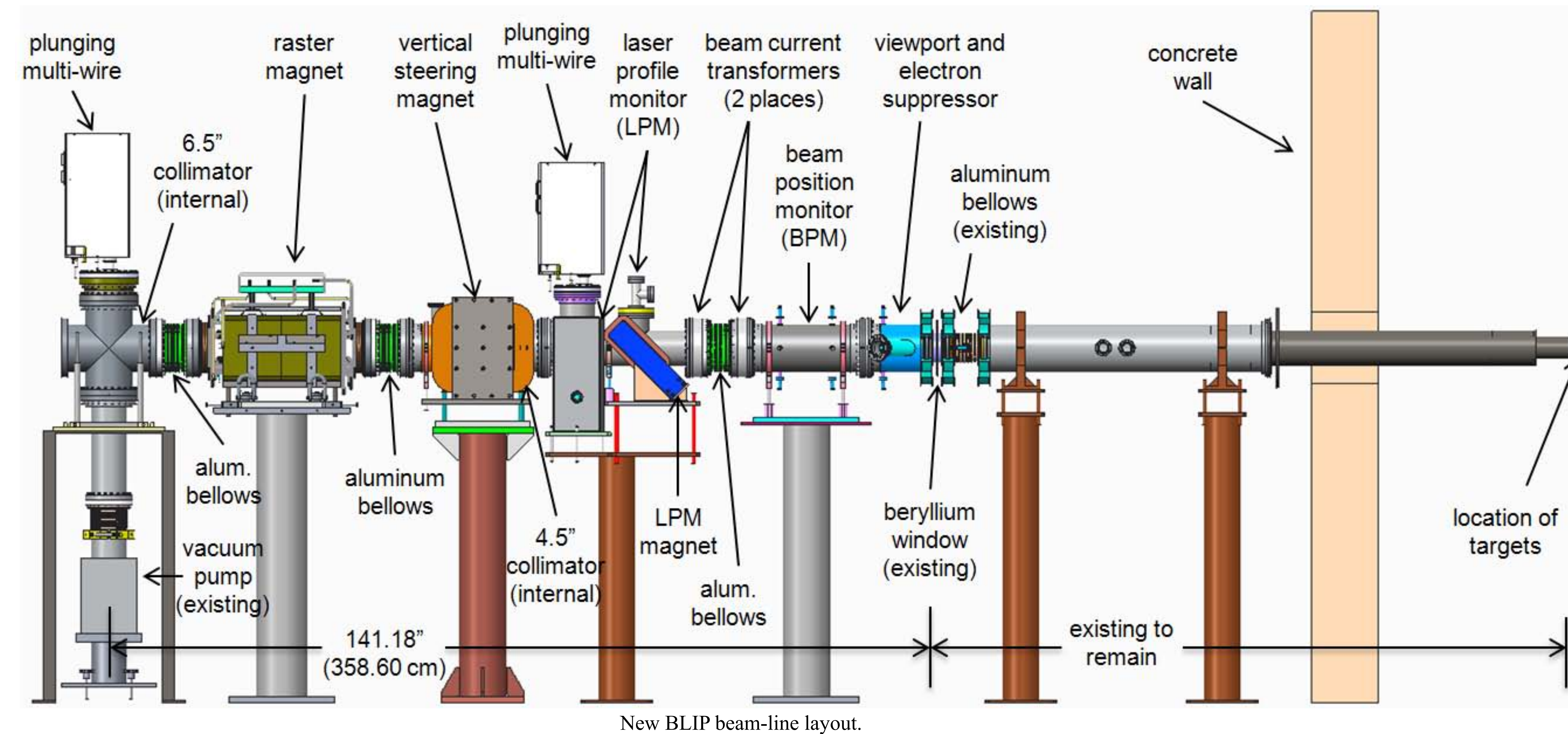
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Abstract

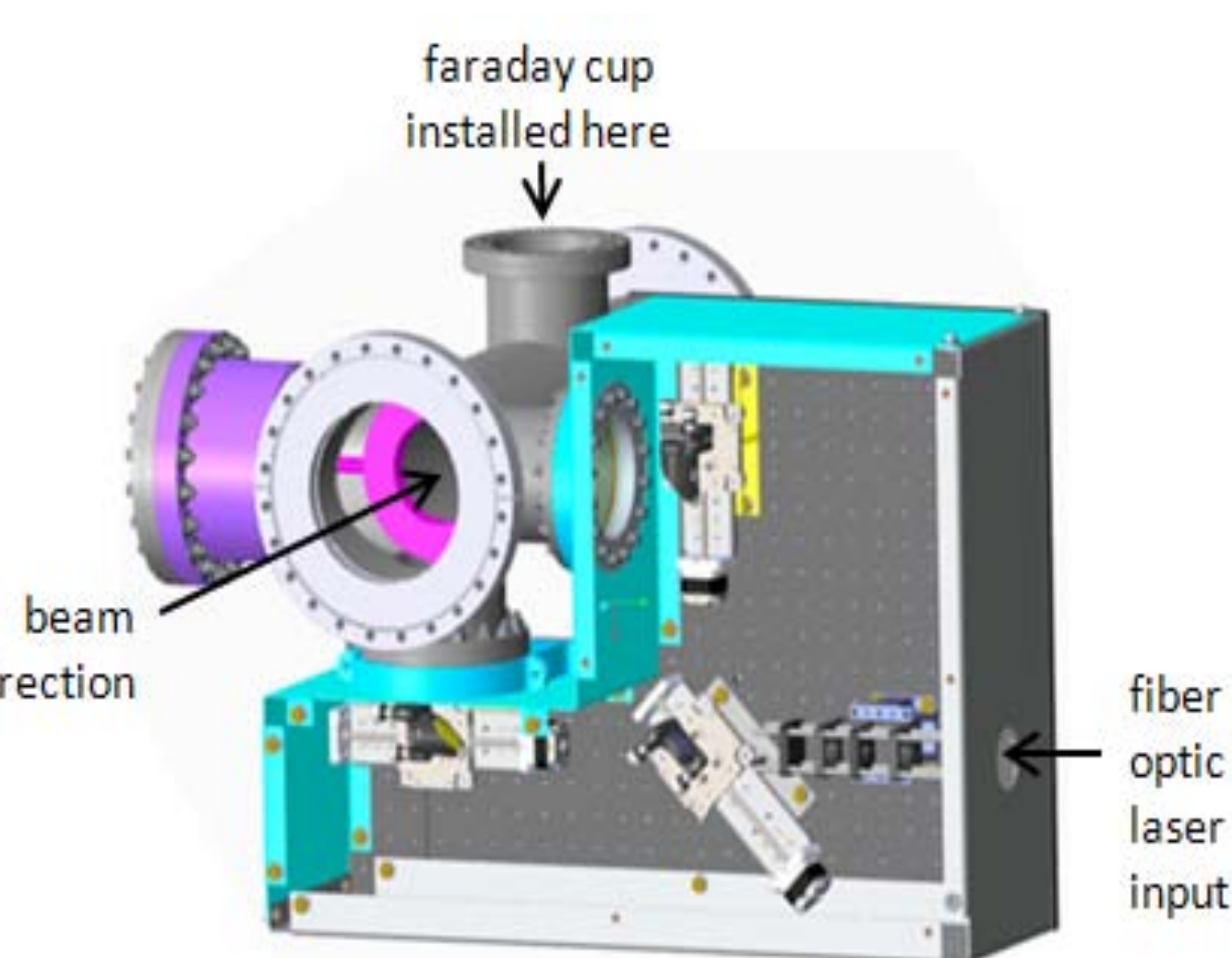
Brookhaven National Laboratory's BLIP facility produces radioisotopes for the nuclear medicine community and industry, and performs research to develop new radioisotopes desired by nuclear medicine investigators. A raster scanning system is being installed to provide a better distribution of the H^- beam on the targets, allow higher beam intensities to be used, and ultimately increase production yield of the isotopes. The upgrade consists of horizontal and vertical dipole magnets sinusoidally driven at 5 kHz with 90 deg phase separation to produce a circular raster pattern, and a suite of new instrumentation devices to measure beam characteristics and allow adequate machine protection. The instrumentation systems include multi-wire profile monitors, a laser profile monitor, beam current transformers, and a beam position monitor. An overview of the upgrade and project status will be presented.

Introduction

The purpose of the raster system currently under development at BNL's BLIP facility is to "paint" the H^- beam on the target in a circular pattern in order to provide a more even distribution of beam on the target material. At present, with a Gaussian beam profile, targets such as $RbCl$ melt only in the region of highest beam intensity. This causes a large local density reduction leading to reduced and erratic production yield. The improved rastered beam distribution is expected to result in higher yield of the produced isotopes, especially the critical isotope $Sr-82$.



BLIP raster magnet assembly



BLIP LPM chamber and optics assembly

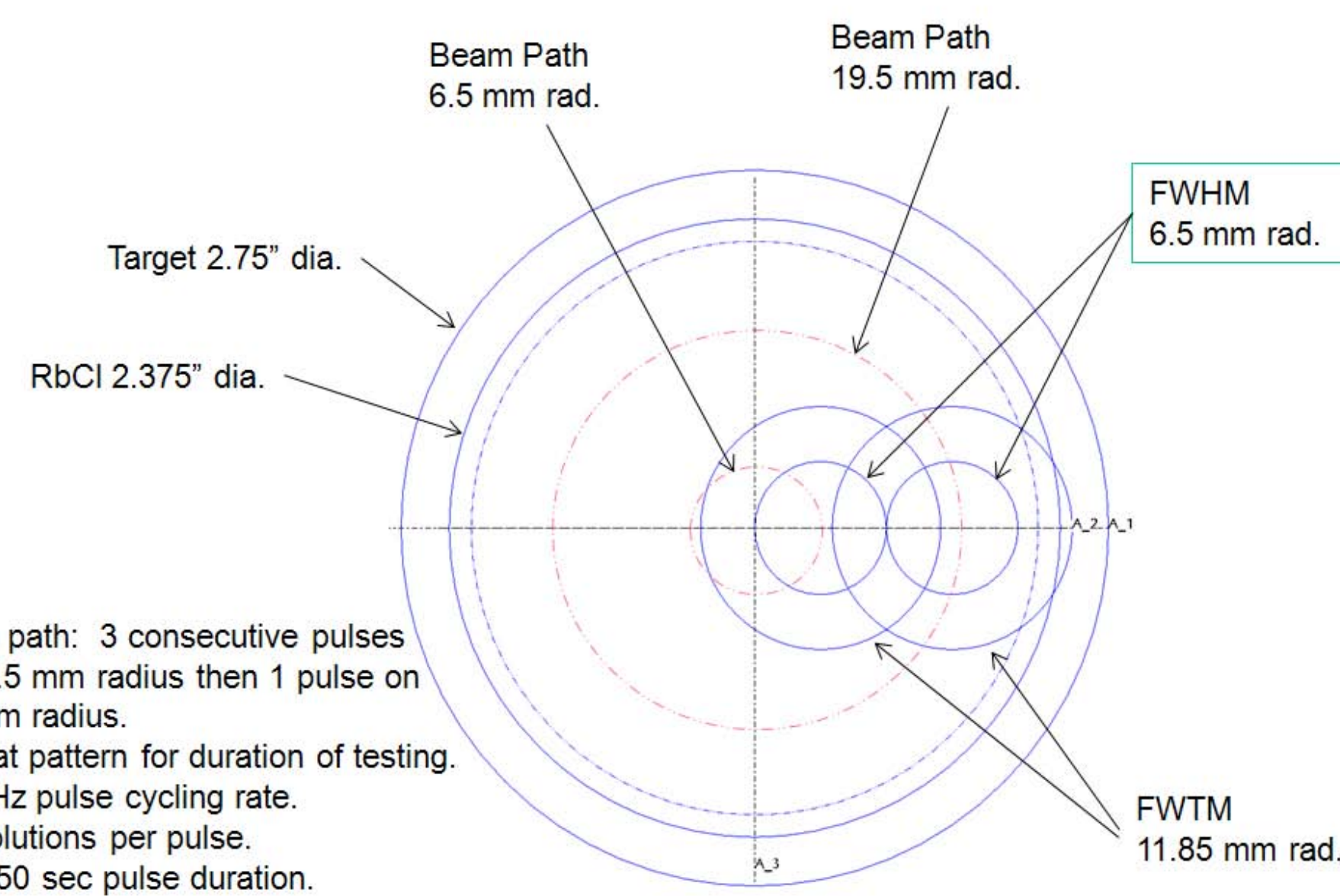
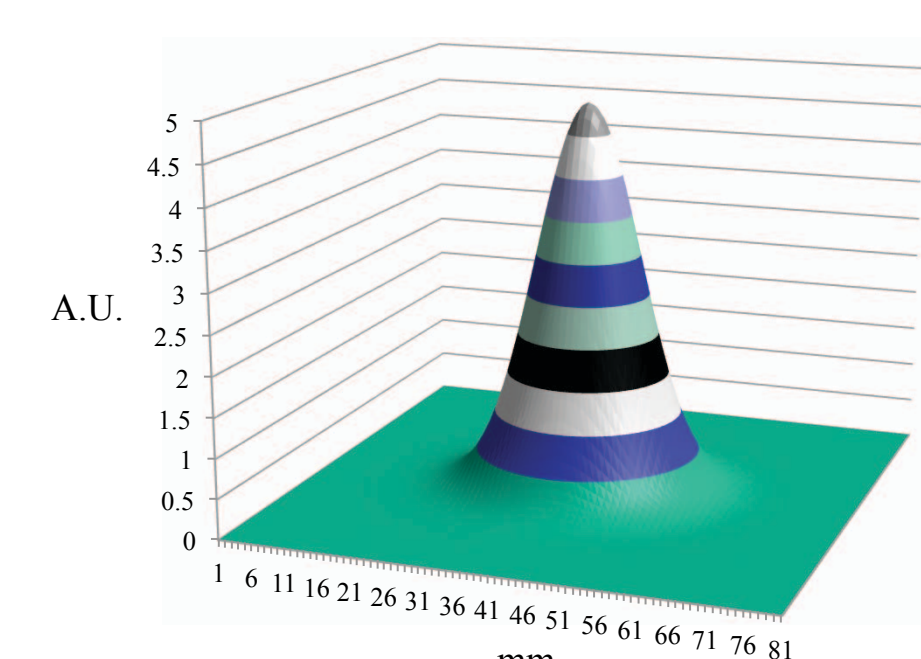
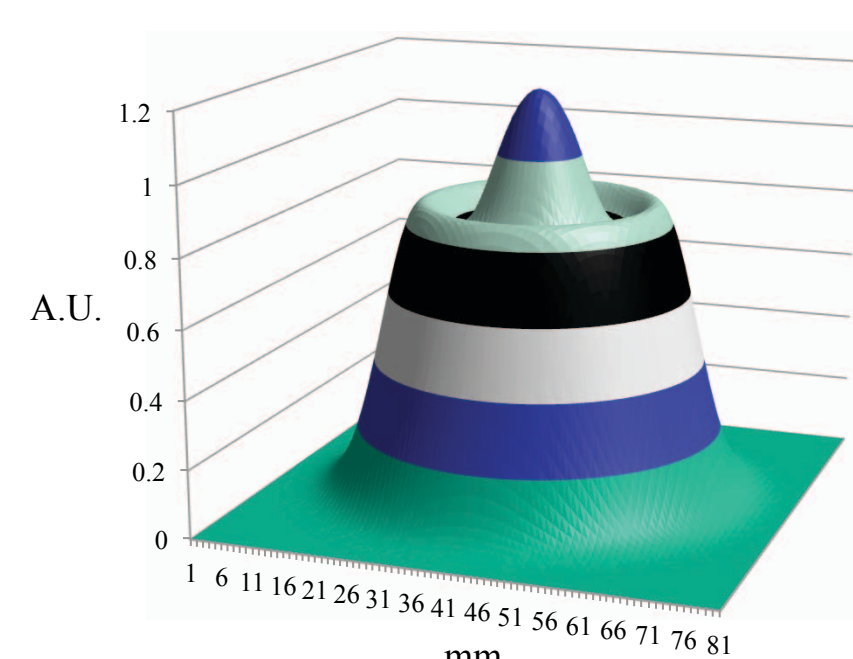


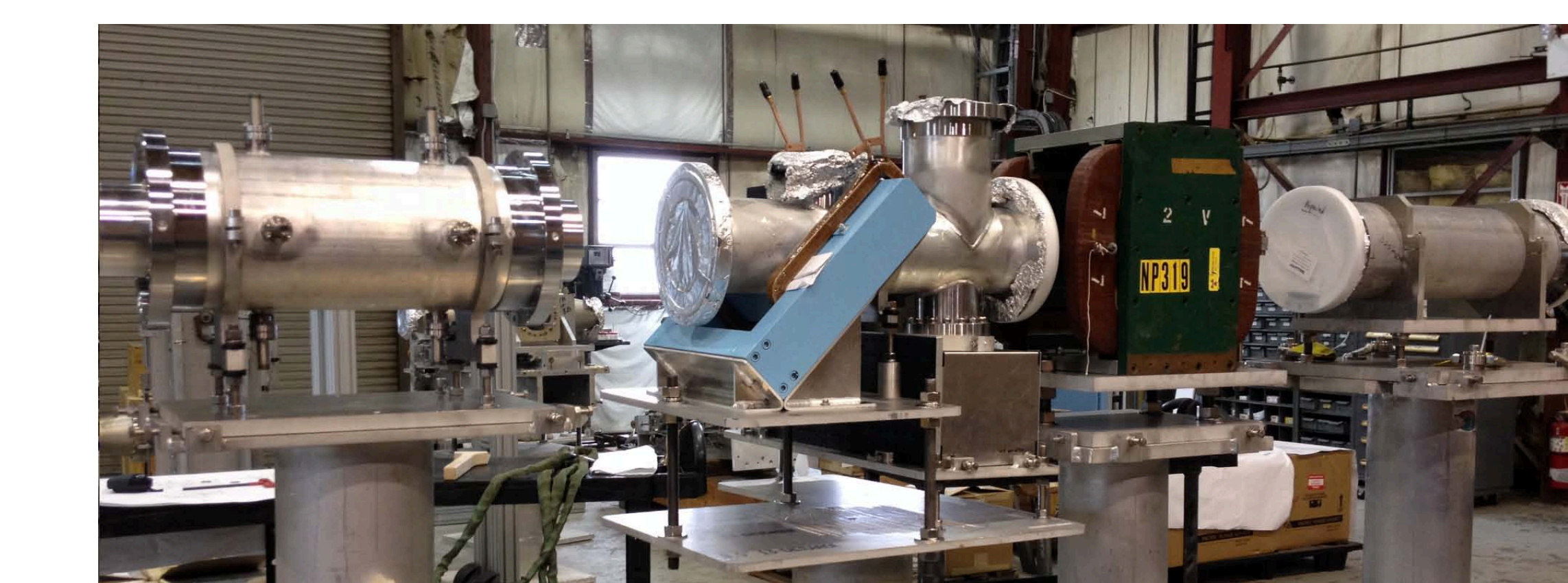
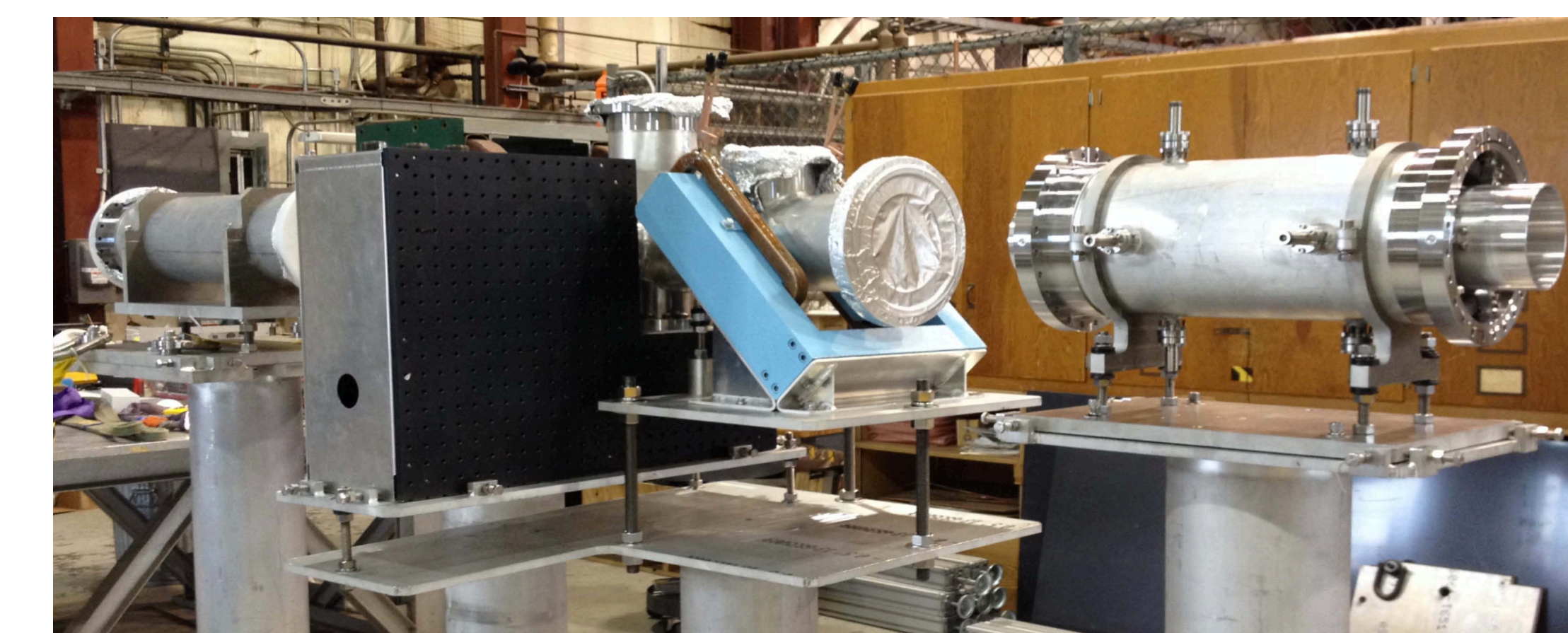
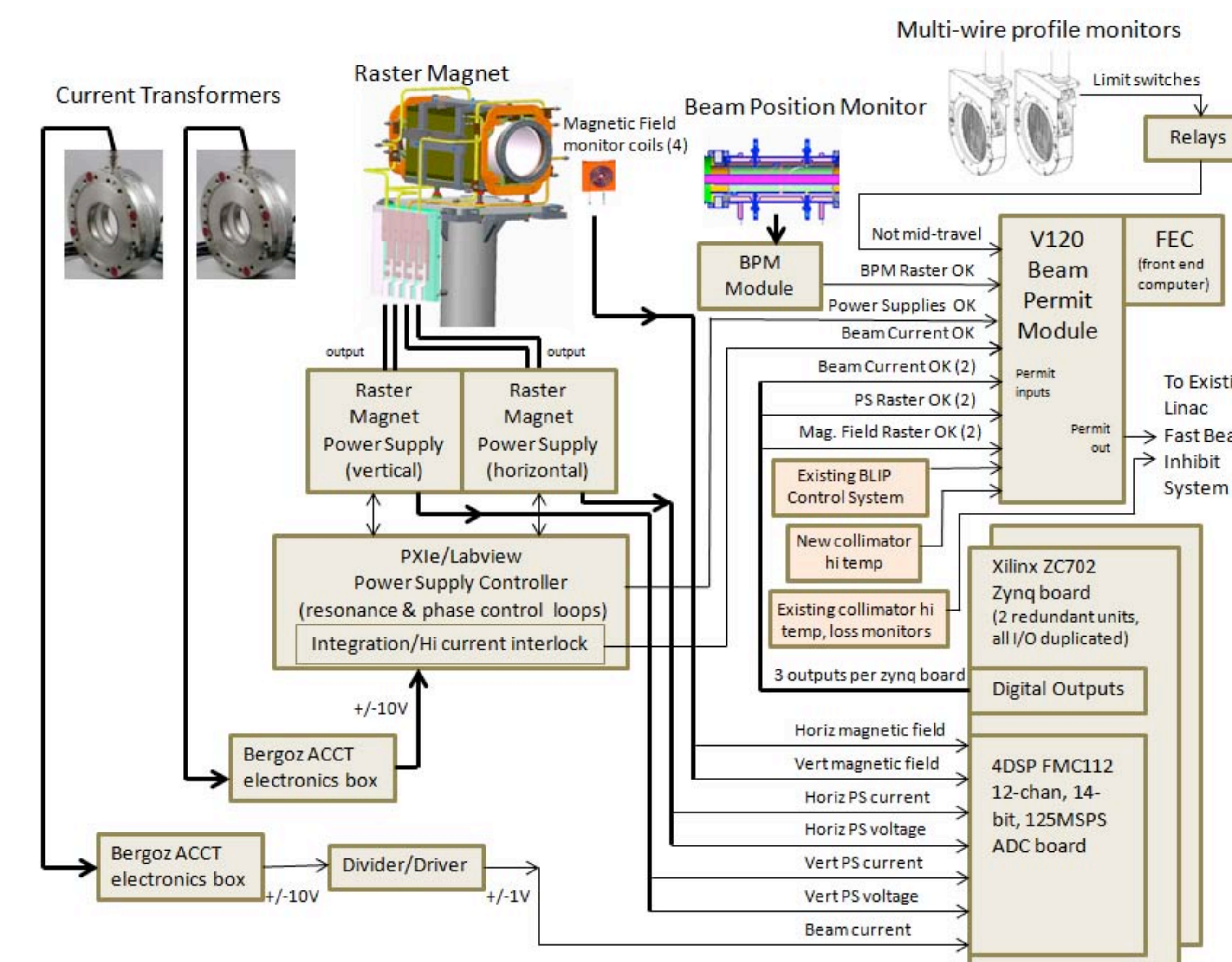
Diagram of circular raster pattern on target.



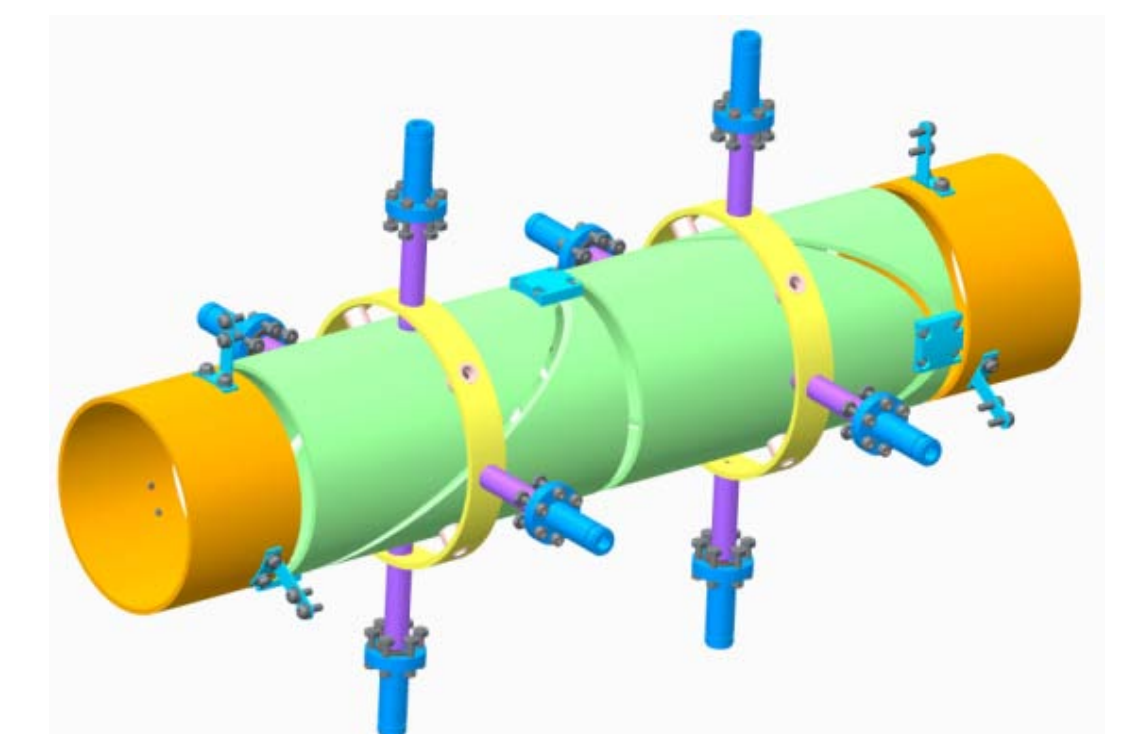
Beam distribution without raster



Beam distribution with raster



Start of beam-line mock-up, photos of both sides shown. In top photo, beam direction is left to right; in bottom photo, beam direction is right to left



BLIP BPM internal components



Work underway in BLIP control room where new electronics will reside