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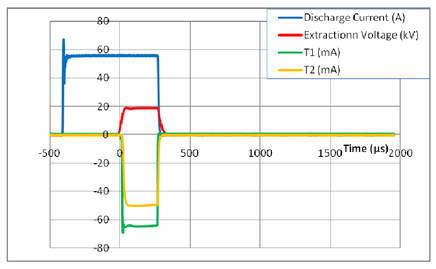
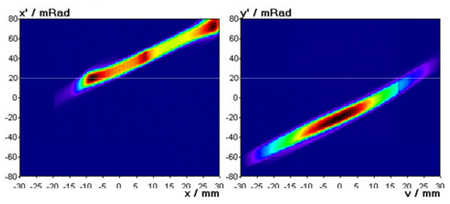
Status Of The RAL Front End Test Stand

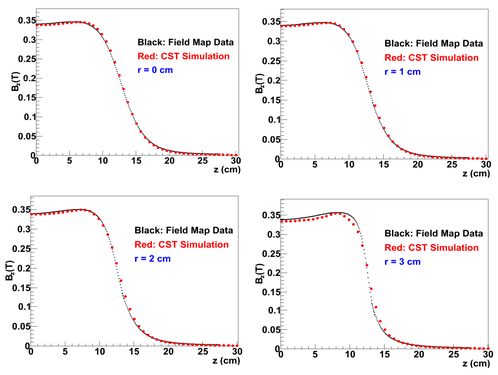
The Front End Test Stand (FETS) under construction at the Rutherford Appleton Laboratory is the UK's contribution to research into the next generation of High Power Proton Accelerators (HPPAs). HPPAs are an essential part of any future Spallation Neutron Source, Neutrino Factory, Muon Collider, Accelerator Driven Sub-critical System, Waste Transmuter etc. FETS will demonstrate a high quality, high intensity, chopped H-minus beam and is a collaboration between RAL, Imperial College and the Universtity of Warwick in the UK and the Universidad del Pais Vasco and ESS-Bilbao in Spain.



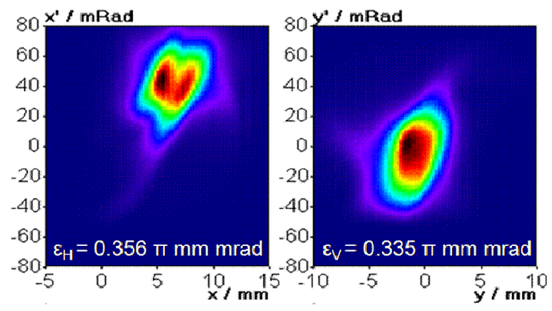
Typical beam current pulses (above) and phase space measurements (below)



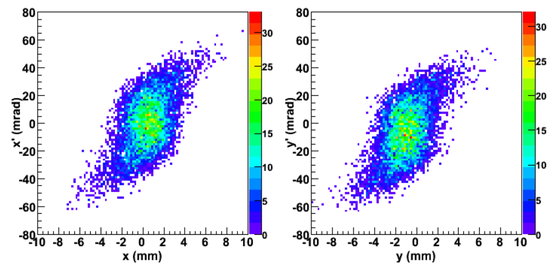
The FETS ion source installation



Comparison of calculated and measured magnetic field in the LEBT solenoids

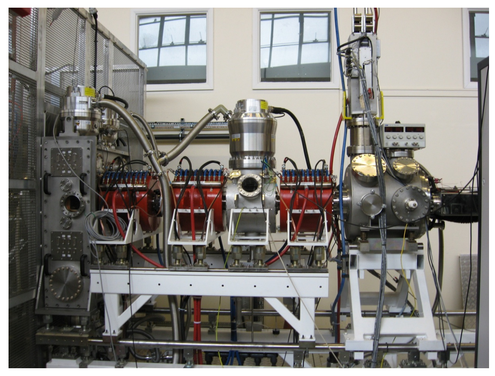


Measured (above) and calculated (below) phase space at the end of the LEBT

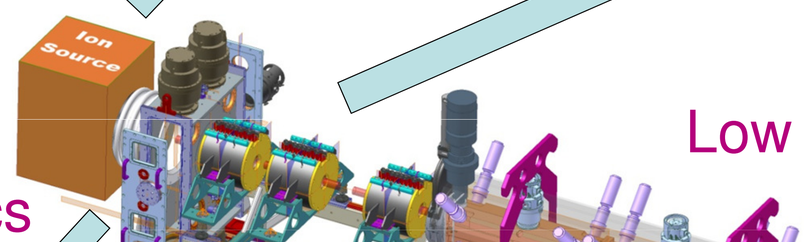


Ion Source

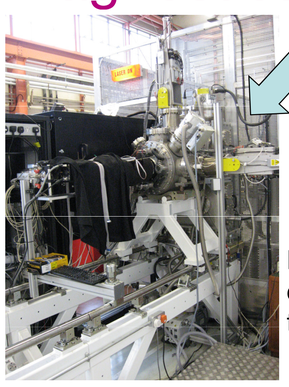
Low Energy Beam Transport



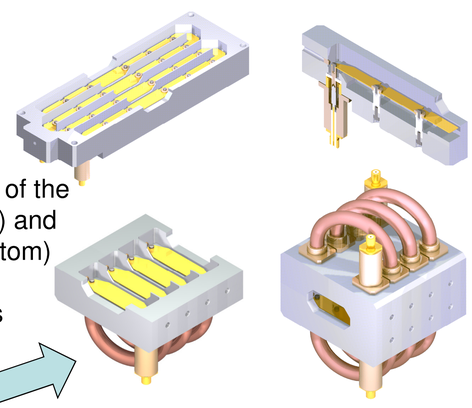
The FETS LEBT installation



Diagnostics



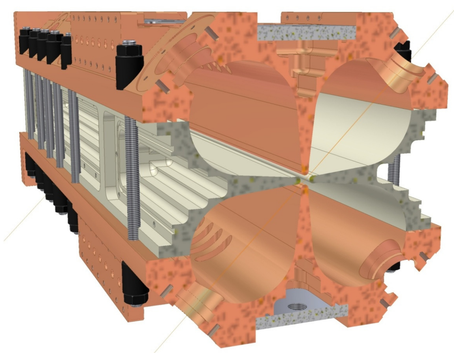
Laser photo-detachment and conventional diagnostics on the FETS ion source



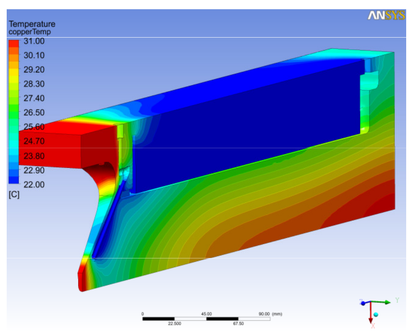
Prototypes of the planar (top) and helical (bottom) chopper assemblies

Beam Chopper

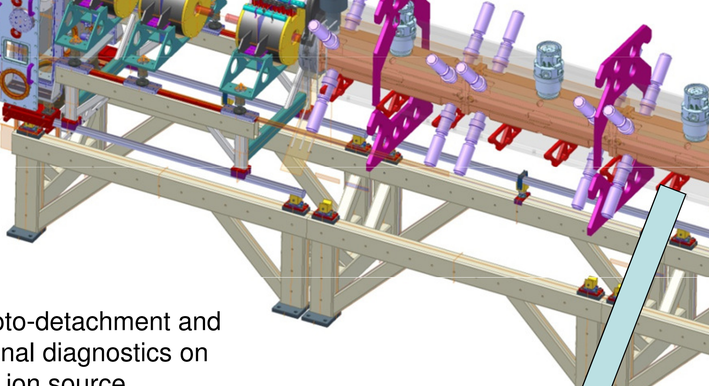
Radio Frequency Quadrupole



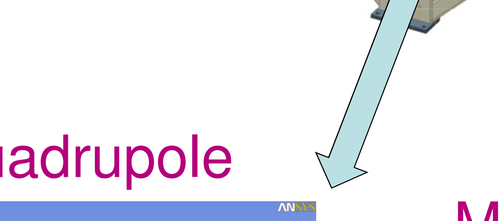
Engineering designs for the FETS RFQ



Thermal analysis of the RFQ vane

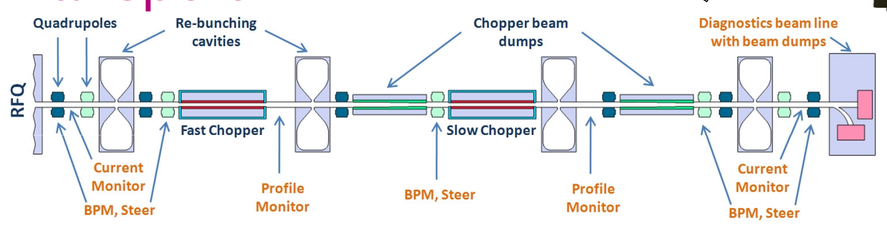


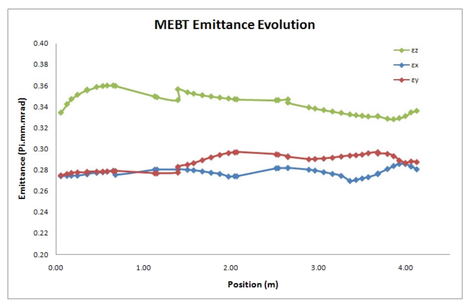
Integrated engineering and physics of the RFQ



Digital IQ RF control system

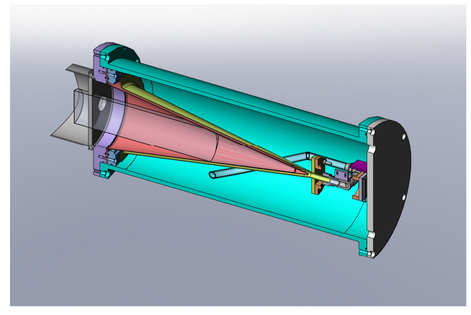
Medium Energy Beam Transport



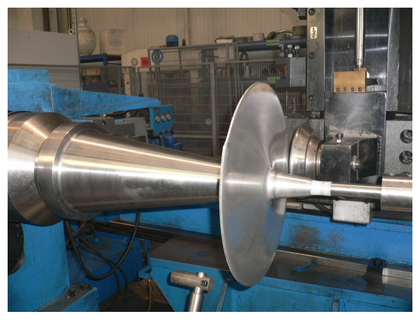


The layout of the FETS MEBT and chopper line (above) and the emittance evolution (right)

Beam Dump



FETS RFQ support structure



Design of the 18 kW beam dump (above) and spinning of the ultra-pure Aluminium (left)

The Front End Test Stand Collaboration

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Imperial College London
ASTeC
THE UNIVERSITY OF WARWICK
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Universidad del País Vasco
Euskal Herriko Unibertsitatea