

RFQ Energy Measurement without end plate

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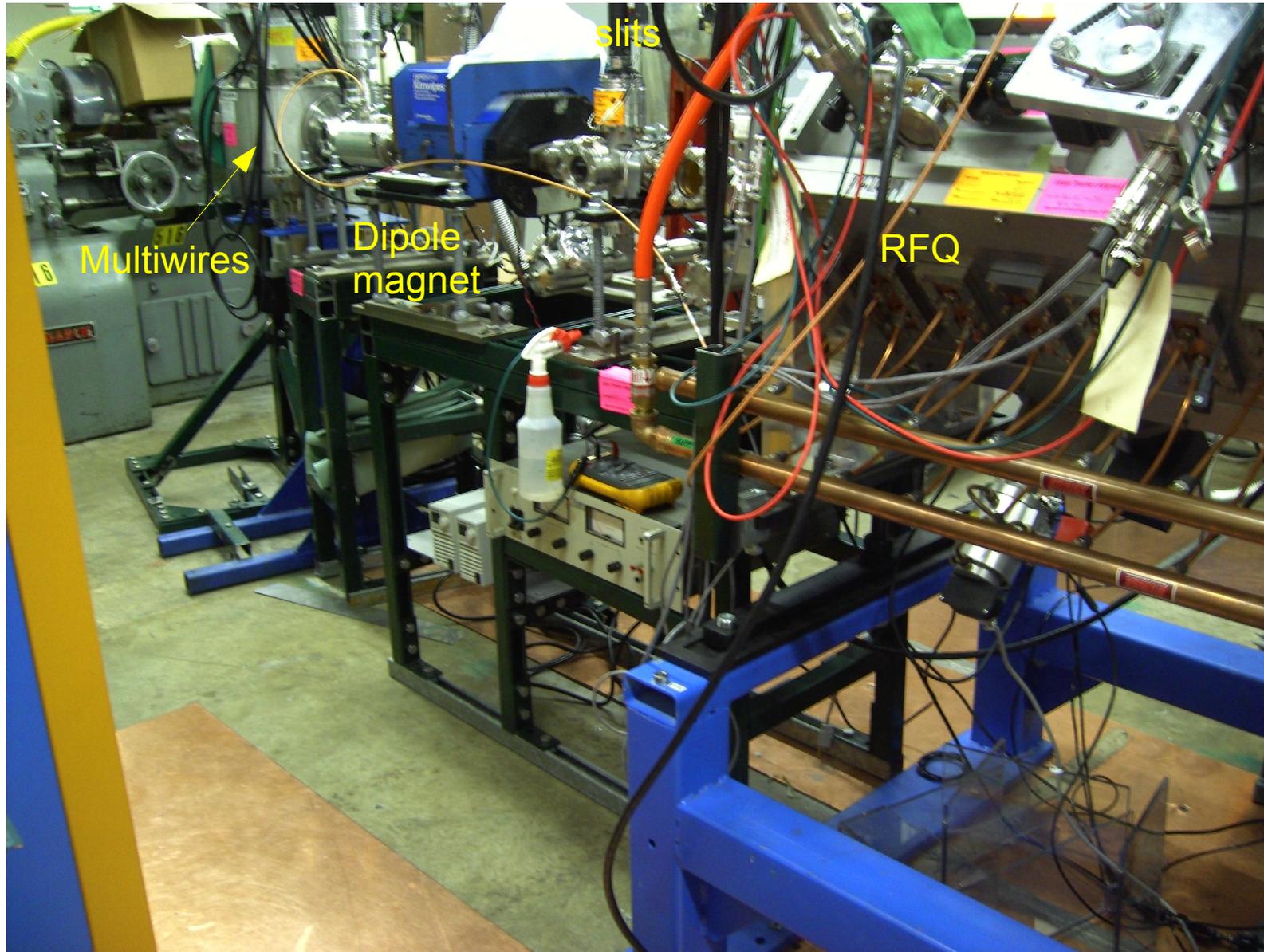
Goal

- From simulations done by S. Kurennoy (LANL), G. Romanov (FNAL) and J. Schmidt (U. Frankfurt) the E_z field between the rod and the end plate changes the energy of the beam.
- The goal is to measure the energy of the beam with the end plate removed.

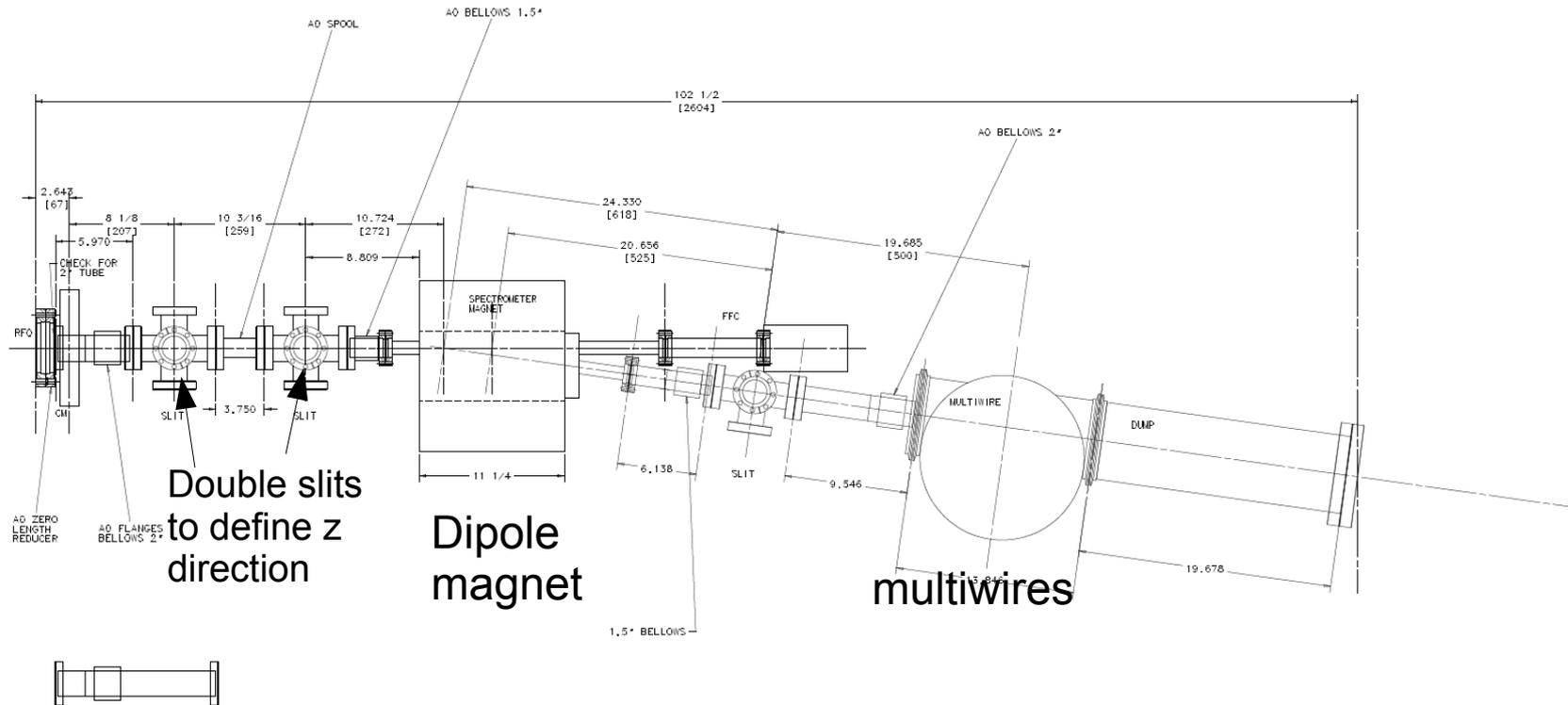
End Plate of RFQ removed



Spectrometer



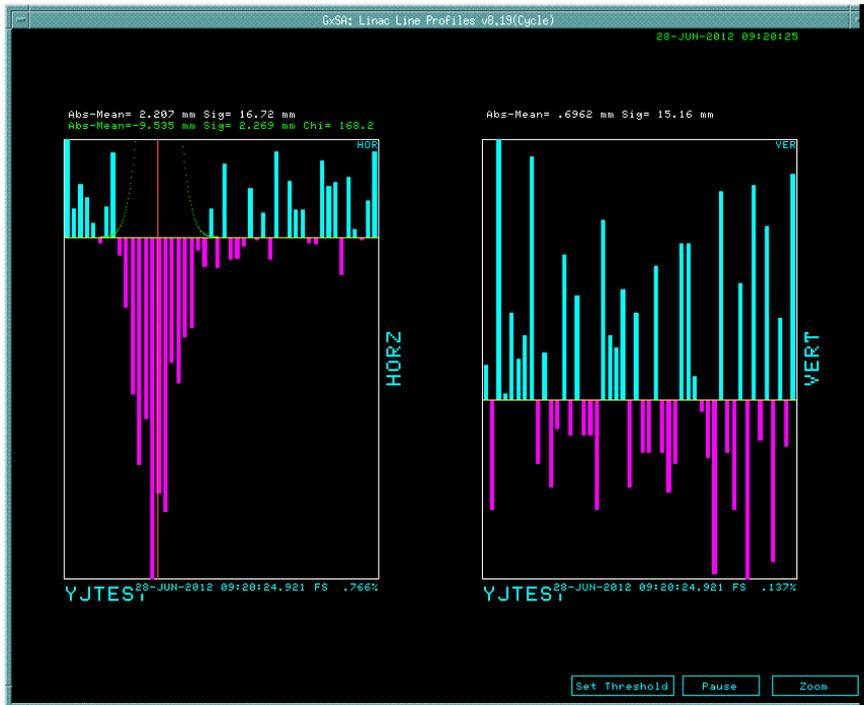
Spectrometer layout



Dimensions and distances are approximate (things were moved).
 Deflection angle required to get to centre of multiwires is 12 deg.

UNLESS OTHERWISE SPECIFIED		ORIGINATOR	
±	±	±	CP=HH
±	±	±	CHECKED
1. BREAK ALL SHARP EDGES		APPROVED	
2. DO NOT SCALE DRAWING		USED ON	
3. DIMENSIONS READ FROM		DATE	
4. MAT. ALL MACH. SURFACES		MATERIAL	
5. DRAWING UNITS:			
FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
SCALE	DRAWING NUMBER	SHEET	REV
		1 OF 1	
CREATED WITH :	GROUP :		

Beam as seen on multiwires



Magnet at 7.2 A

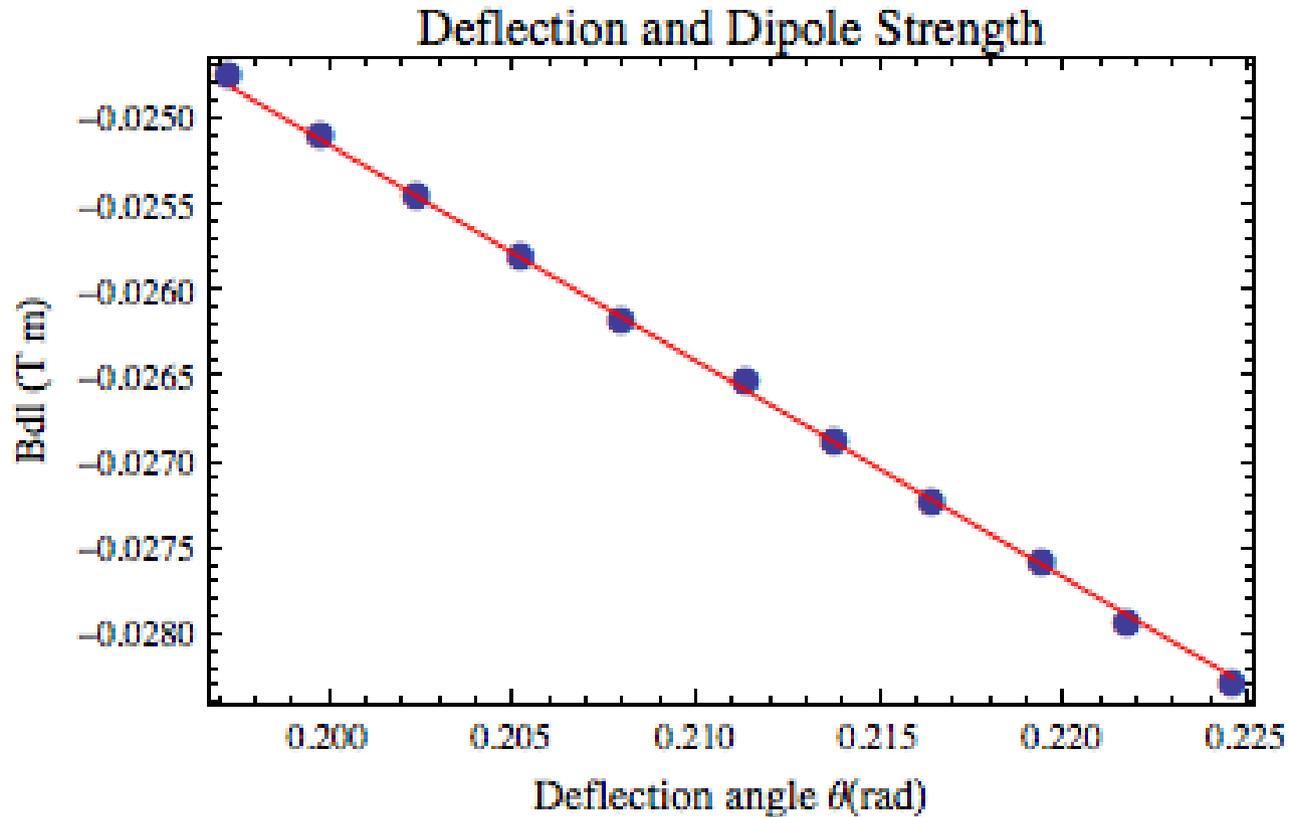


Magnet at 7.4 A

RFQ set to approx 170 kW of forward power, 3 kW reflected

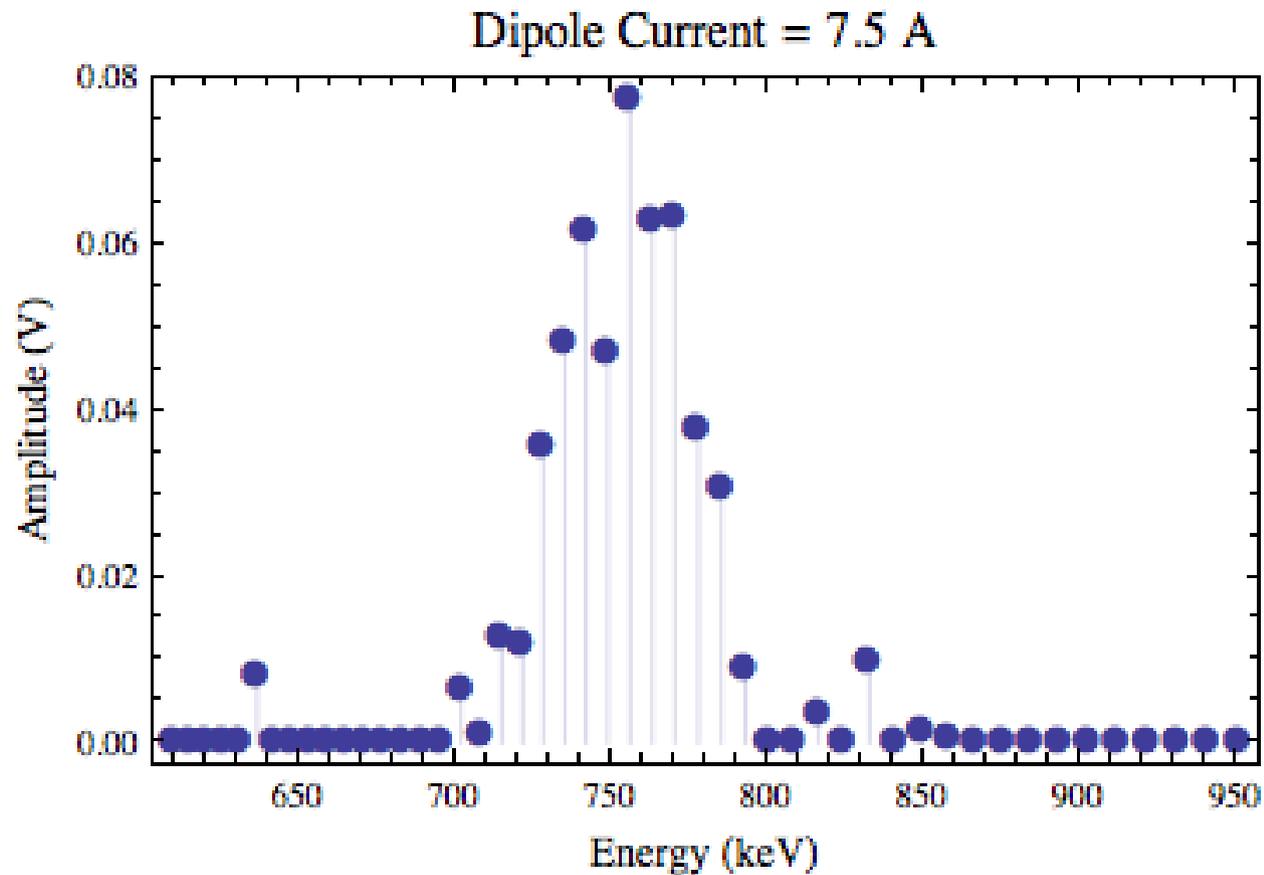
Data Analysis

The position of the beam distribution is analyzed by tracking the average position as the dipole magnet strength is changed.



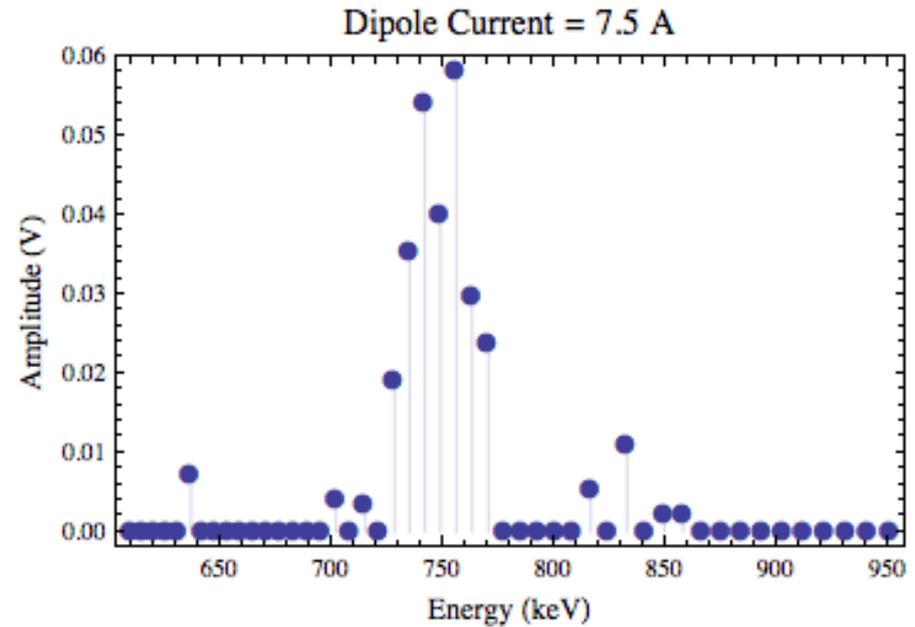
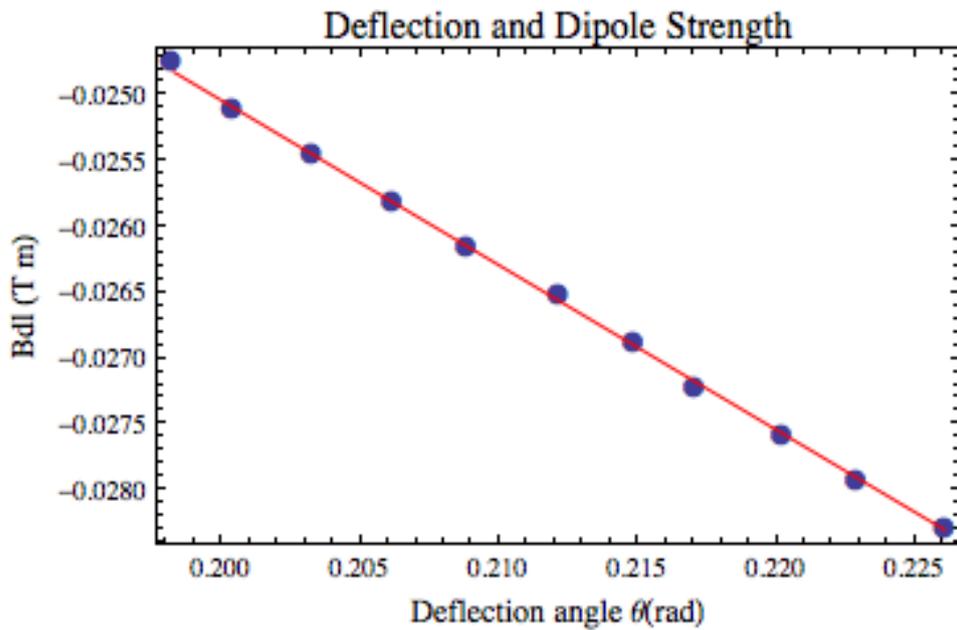
Energy is (756.5 ± 0.5) keV

Energy Spectrum



It is clear from the spectrum that the energy is around 750 keV!!!!

RF power at 150 kW, 3 kW reversed



Energy=(750.0 +/- 0.5) keV