3_IMS_Plateau.doc

The following data was taken by hand during Ray's 1st visit. The absolute intensity of the beam was not known. From the first two plots, it does not appear that the MCP Start Rate reaches a plateau, until we get to 2800V, and then only for the two lowest rates. Normally we set the Start MCP to 2500V, thus if we register a rate of say 15000, the true rate is probably greater than 30,000 Hz.
The 2nd set of plots show the plateau curves for the ST stops, (same MCP as ST Starts!) now these curves look good at MCP HV=2500, for all rates.
The 3rd set of plots show the plateau curves for the LEF stops. Note the Top MCP was operating at 640 V due to the reduced HV (12kV) on the TOF section. There is a fall of in count rate above 1500V for the two highest beam intensities. Cause for this is not known.

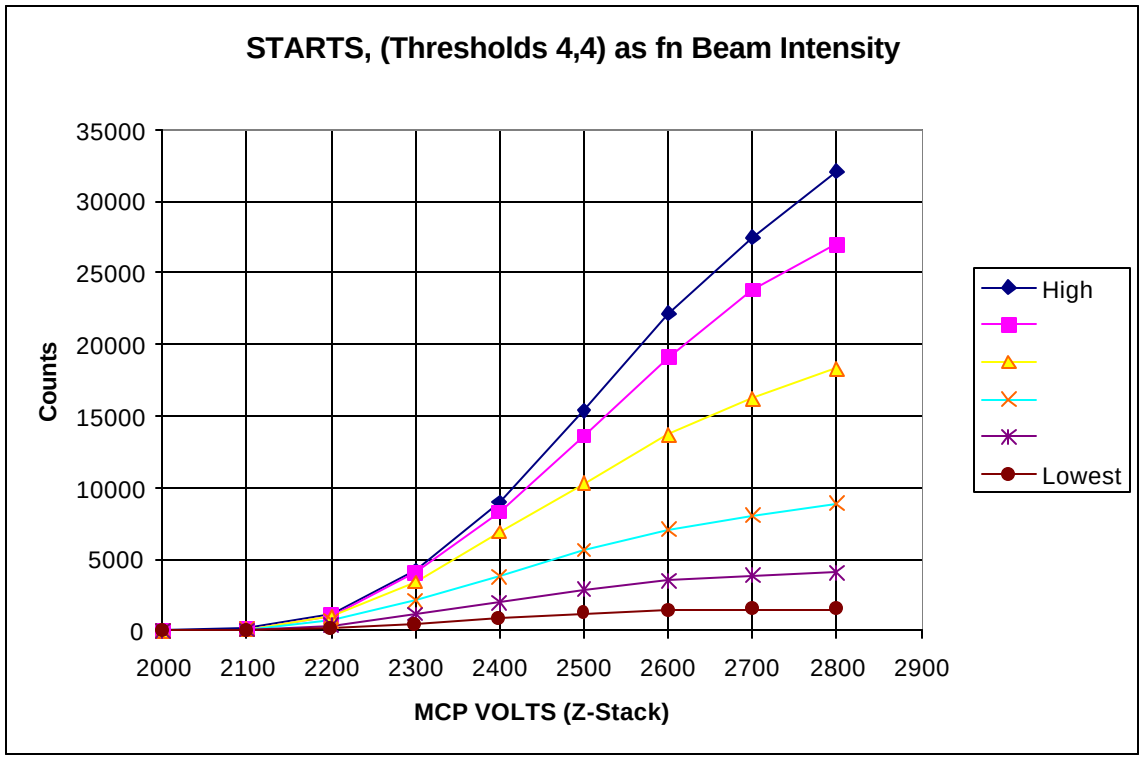
File/Plot	Egy (eV)	Species	TOF	Thr	Anode/Foil	Time	Notes/Intensity
Plots 1a,b	5000	20Ne+	12.00kV	4,4	4	1 sec/point	Starts
Plots 2a,b	5000	20Ne+	12.00kV	4,4	4	1 sec/point	ST Stops
Plots 3a,b	5000	20Ne+	12.00kV	4,4	4	1 sec/point	LEF Stops

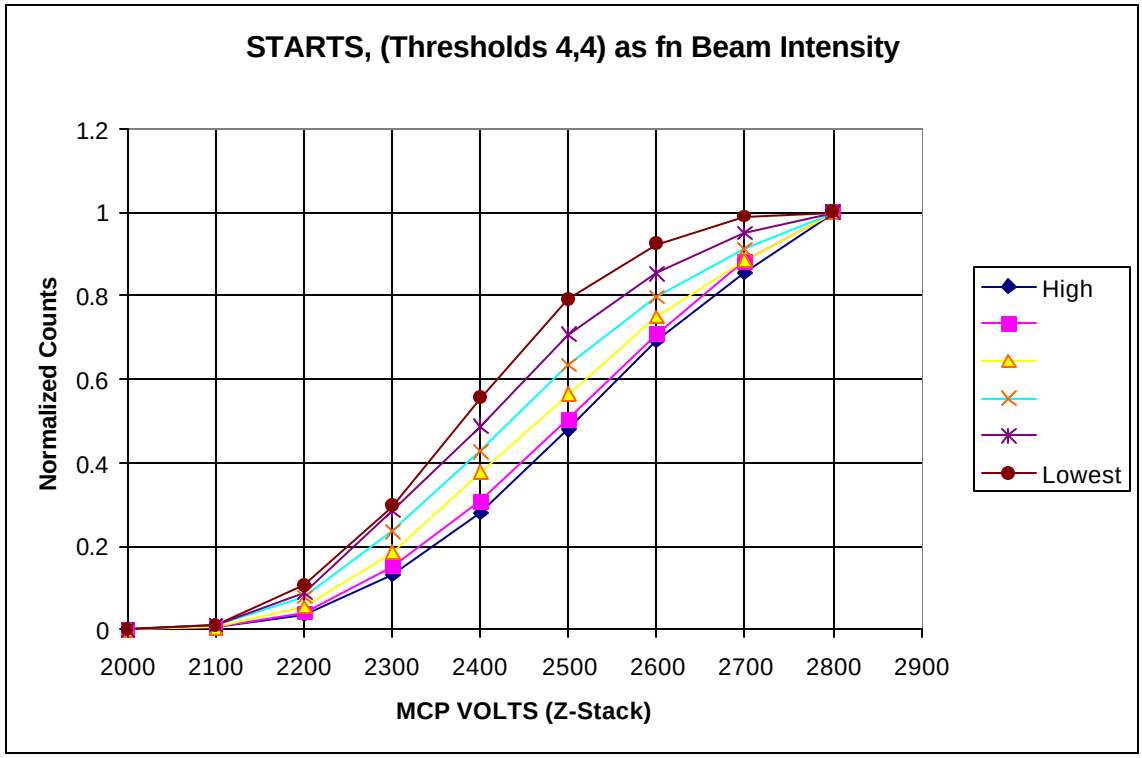
The following data was taken using the computer system, 10/17/02

File/Plot	Egy (eV)	Species	TOF	Thr	Anode/ Foil	Notes/Intensity
Plot 4, IMS083	5000	20Ne+	14.56kV	4,4	4	LEF Top Plate 15-20% effect
Plot 5 IMS085, 088	5000	20Ne+	14.56kV	4,4 – 15,15	4	ST Starts v Scan Direction, Threshold (High Rates)
Plot 6 IMS085, 088	5000	20Ne+	14.56kV	4,4 – 15,15	4	ST Stops, v Scan Direction, Threshold (High Rates)
Plot 7 IMS085, 088	5000	20Ne+	14.56kV	4,4	4	LEF Stops, v Scan Direction, Threshold (High Rates)
Plot 8a,b IMS089, 096	5000	20Ne+	14.56kV	4,4	4	ST Starts, v Beam Intensity
Plot 9a,b IMS089, 096	5000	20Ne+	14.56kV	4,4	4	ST Stops, v Beam Intensity
Plot 10a,b IMS089, 096	5000	20Ne+	14.56kV	4,4	4	LEF Stops, v Beam Intensity
Plot 11a,b IMS097, 103	5000	20Ne+	14.56kV	4,4	0	ST Starts, v Beam Intensity
Plot 12a,b IMS097, 103	5000	20Ne+	14.56kV	4,4	0	ST Stops, v Beam Intensity
Plot 13a,b IMS097, 103	5000	20Ne+	14.56kV	4,4	0	LEF Stops, v Beam Intensity

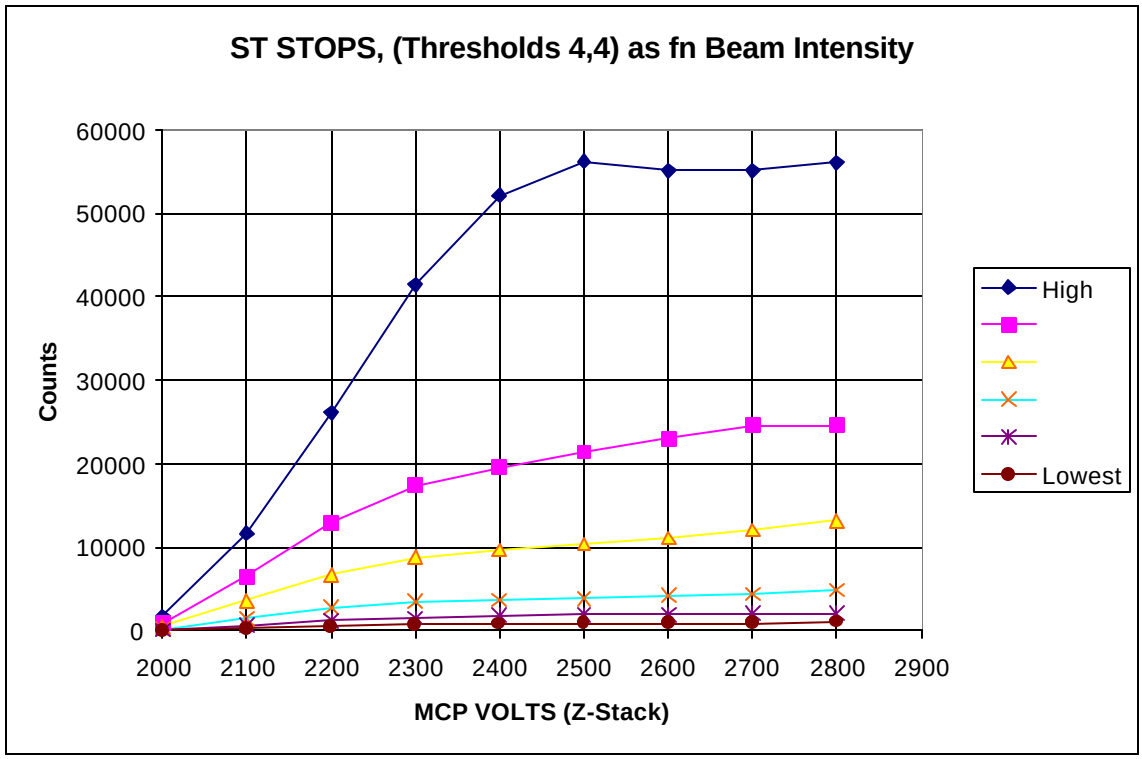
In a nutshell,
In both sets of data for Anode/Foil #4 (manual and computer) the Max Count rate for Starts, ST Stops, and LEF Stops (at MCP HV = 2500V, 1500V) is ~15000, 55000, 42000.
For Anode/Foil #0 these are 24000, 100000, 26000. Was suggested that Foil 0 is thicker than Foil 4.
In both cases the ST Starts give ~ 50% of the expected plateau counts.
The Stops have interesting droop and structure features under High beam rate conditions.

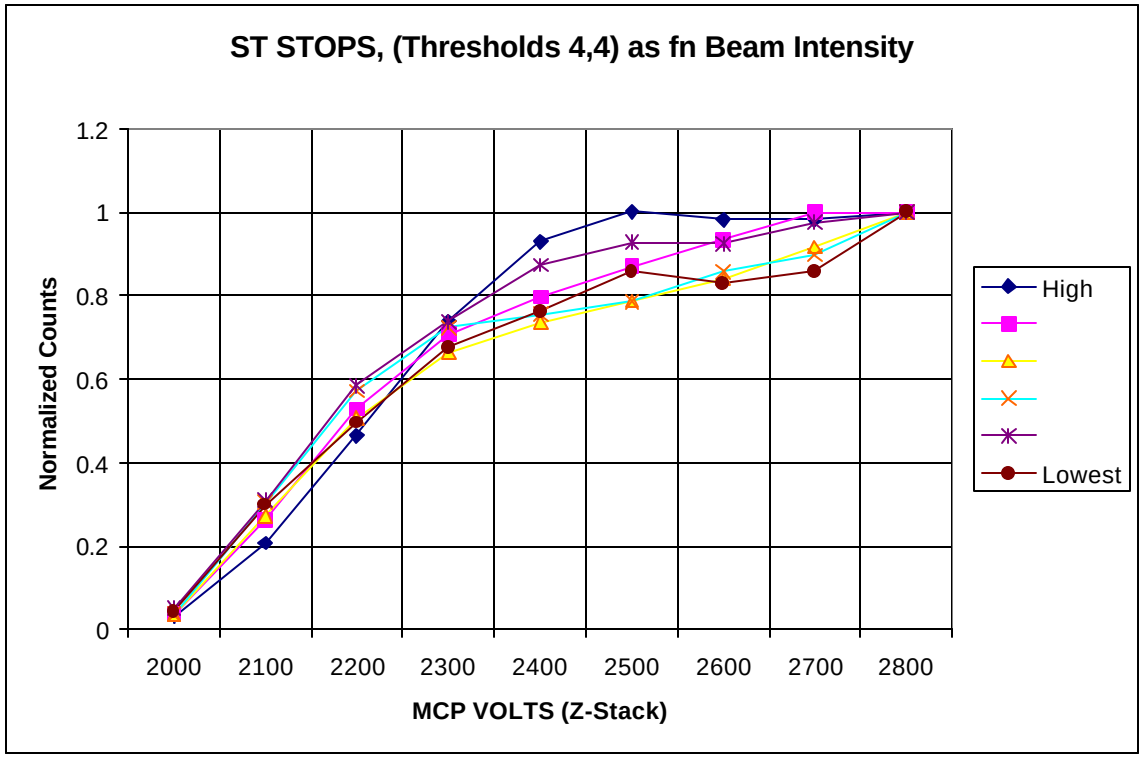
9/18/02 Plots 1a,b Beam 5000eV 20Ne+, TOF at +/-12kV, Thresholds at 4,4 Raw and Normalized Data



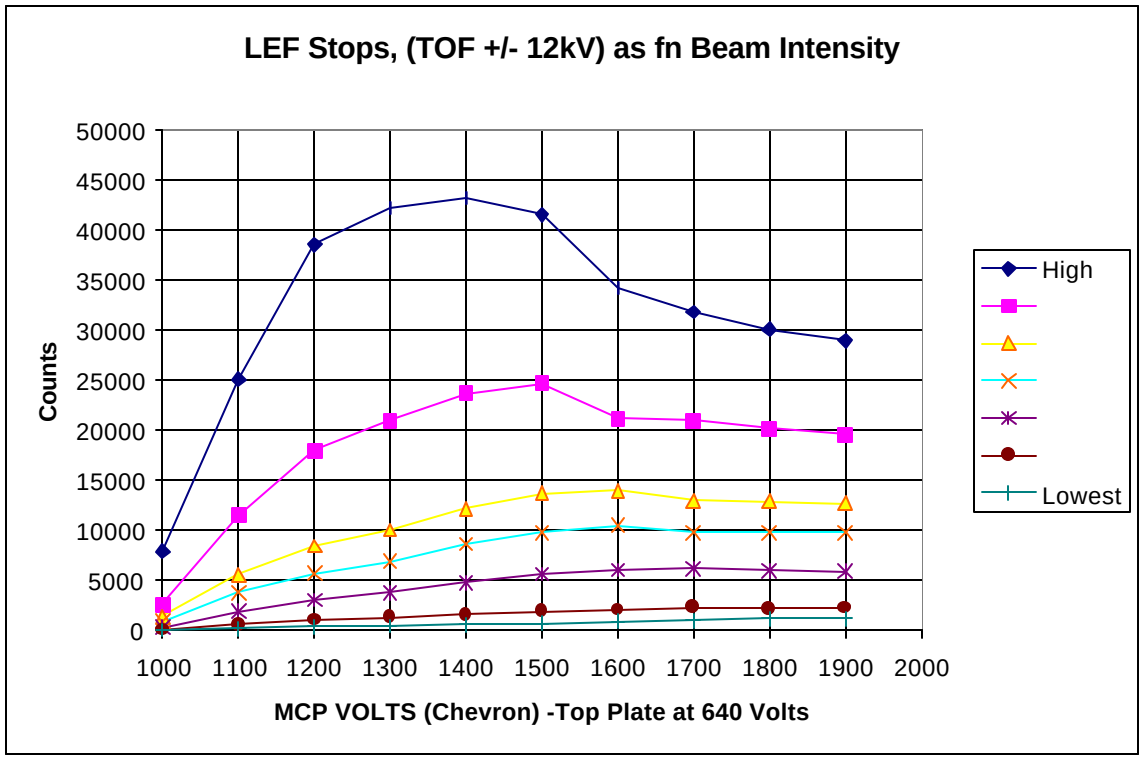


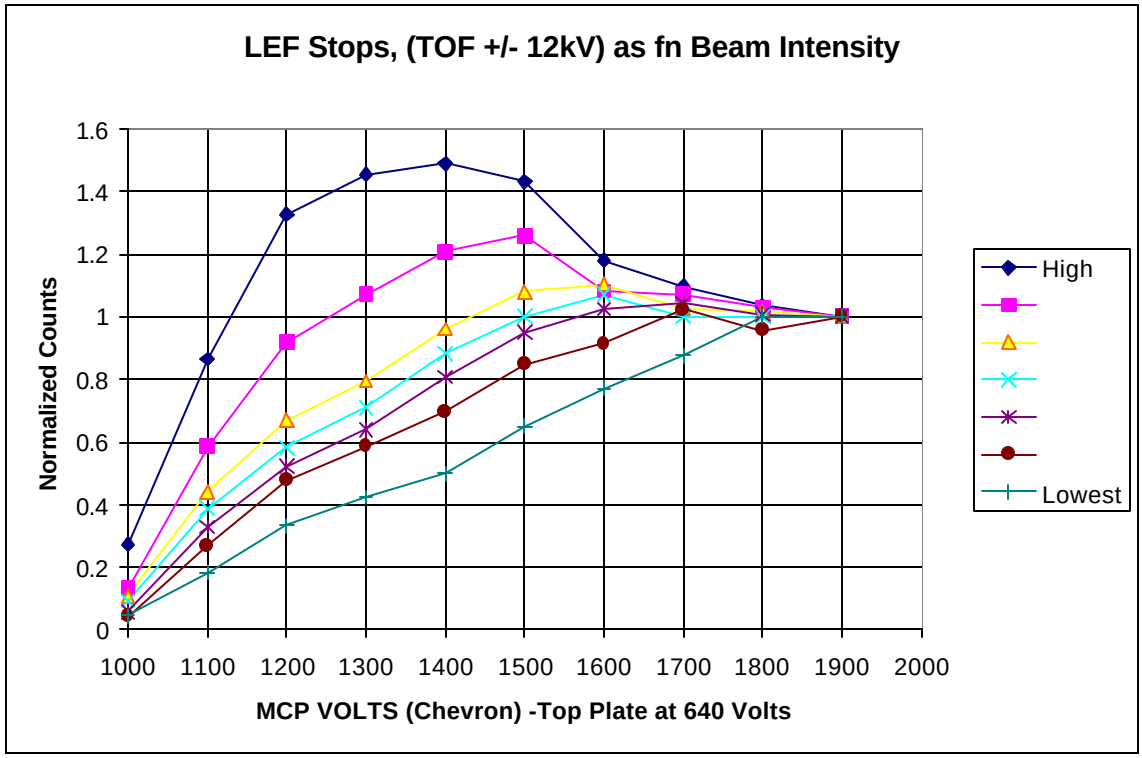
9/18/02 Plots 2a,b Beam 5000eV 20Ne+, TOF at +/-12kV, Thresholds at 4,4 Raw and Normalized Data



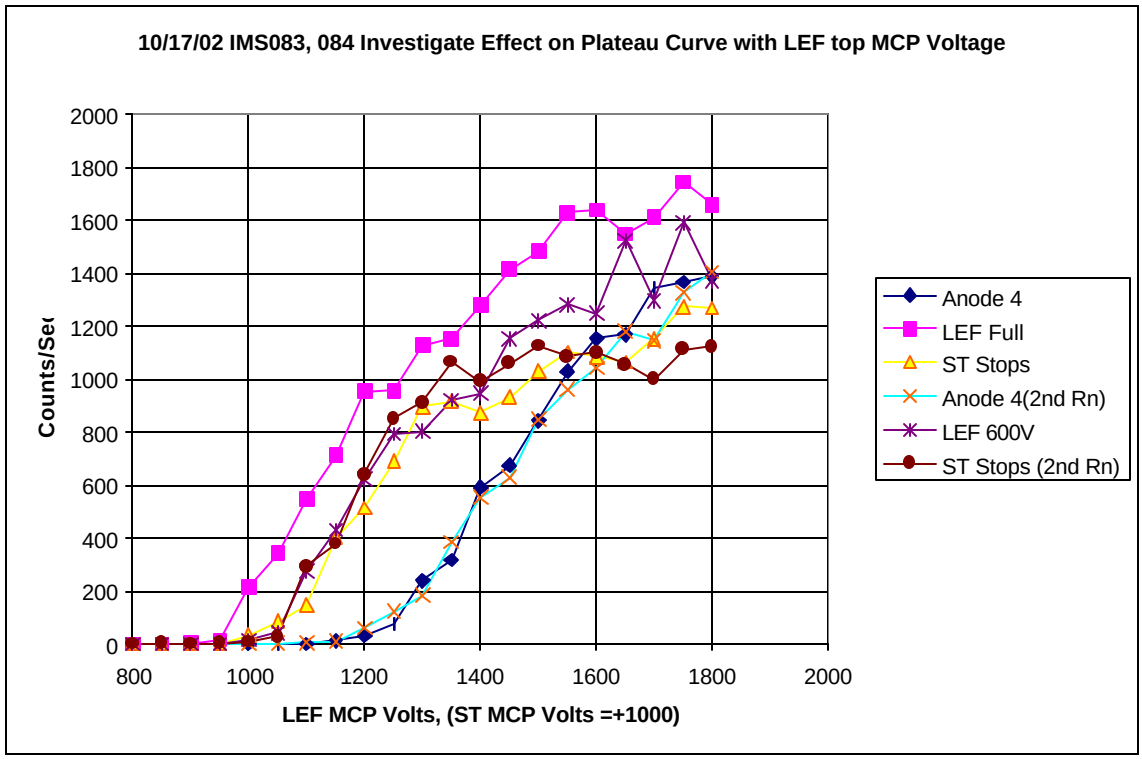


9/18/02 Plots 3a,b Beam 5000eV 20Ne+, TOF at +/-12kV, Thresholds at 4,4 Raw and Normalized Data

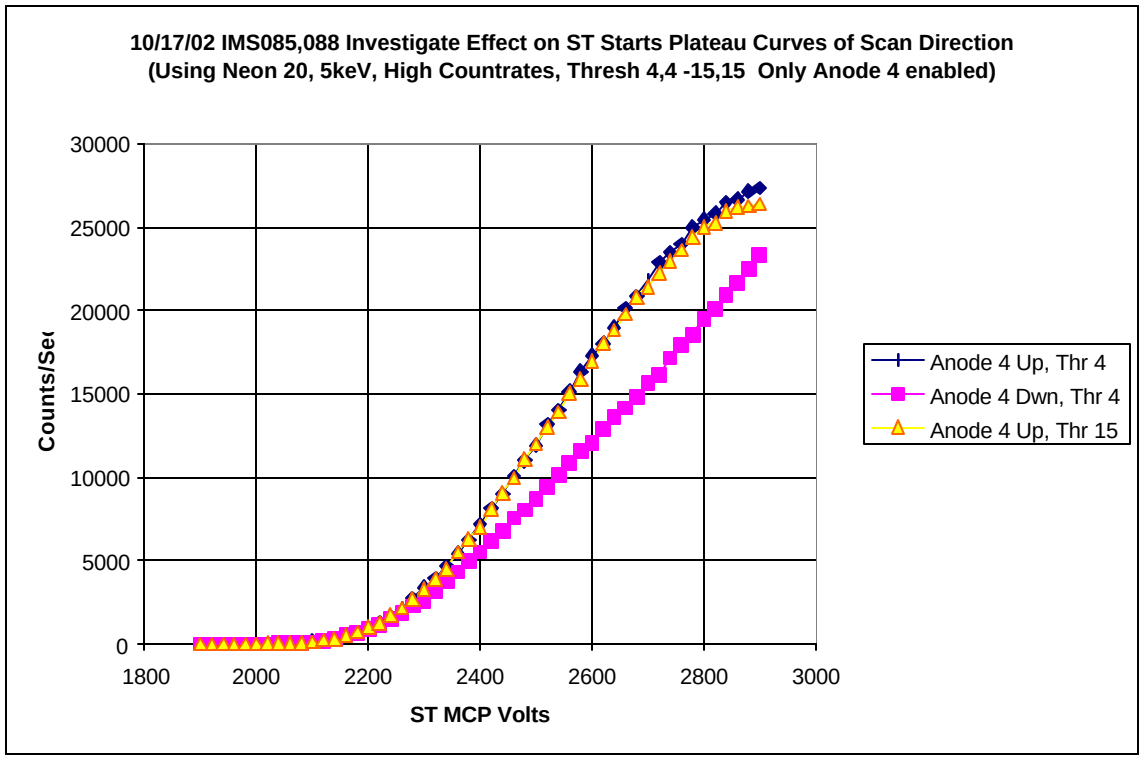




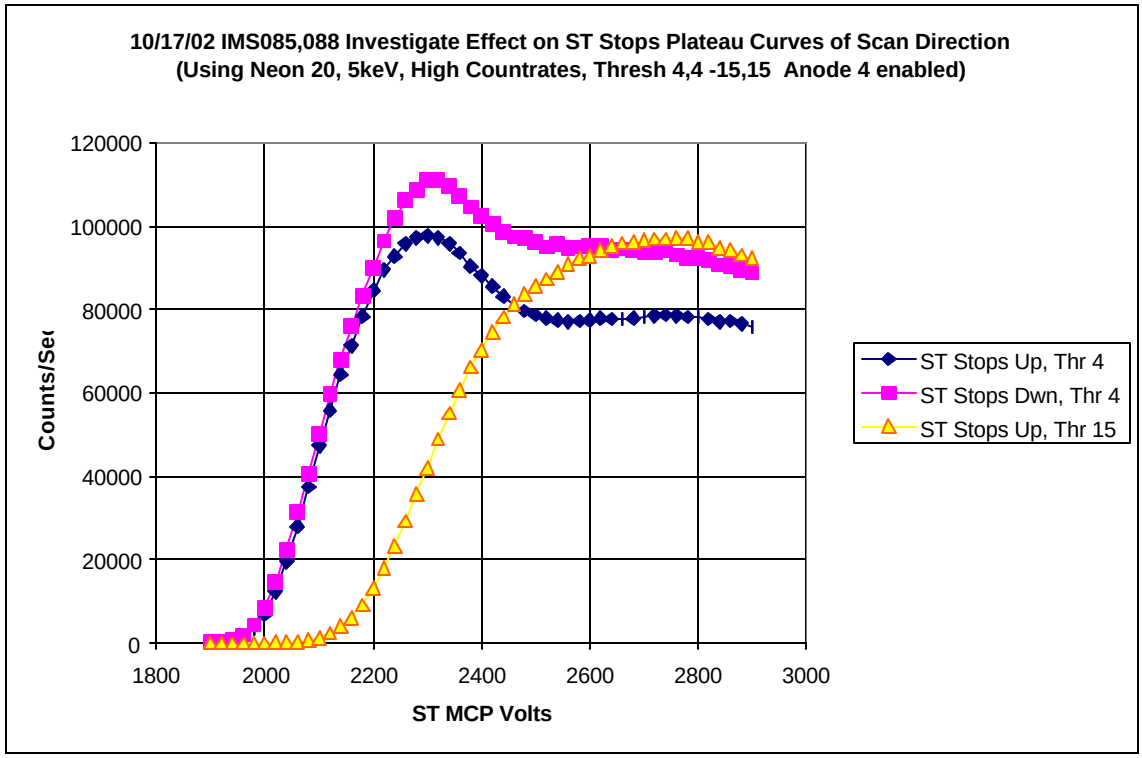
10/17/02 Plot 4, IMS083, 084 Investigate Effect on Plateau Curve with LEF top MCP Voltage



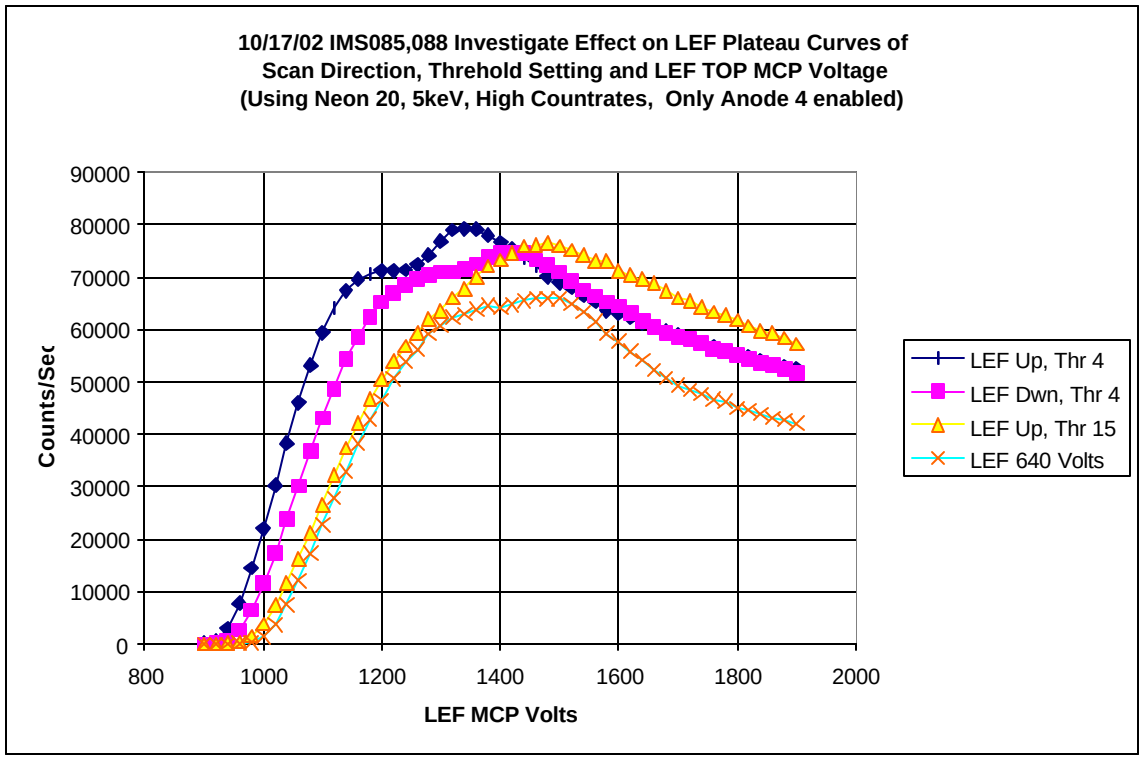
10/17/02 Plot 5, IMS085, 088 Effect on ST Start Plateau Curve with Direction Scan and Thresholds.



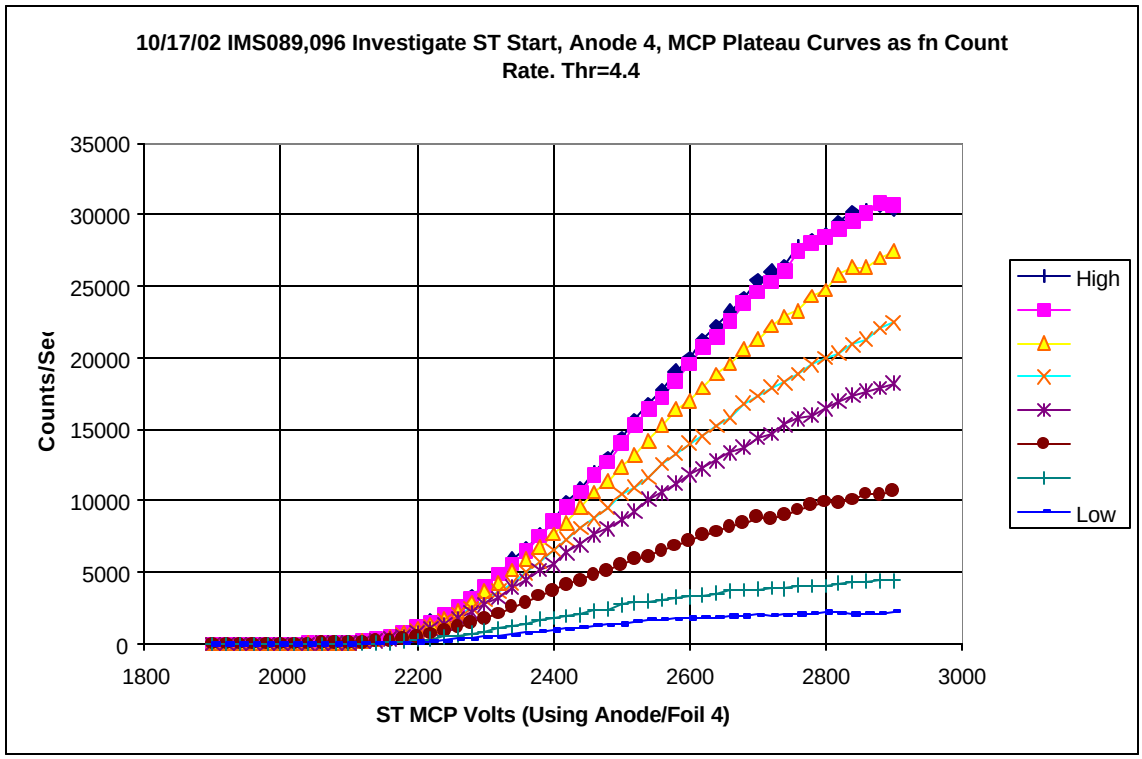
10/17/02 Plot 6, IMS085, 088 Effect on ST Stop Plateau Curve with Direction Scan and Thresholds.

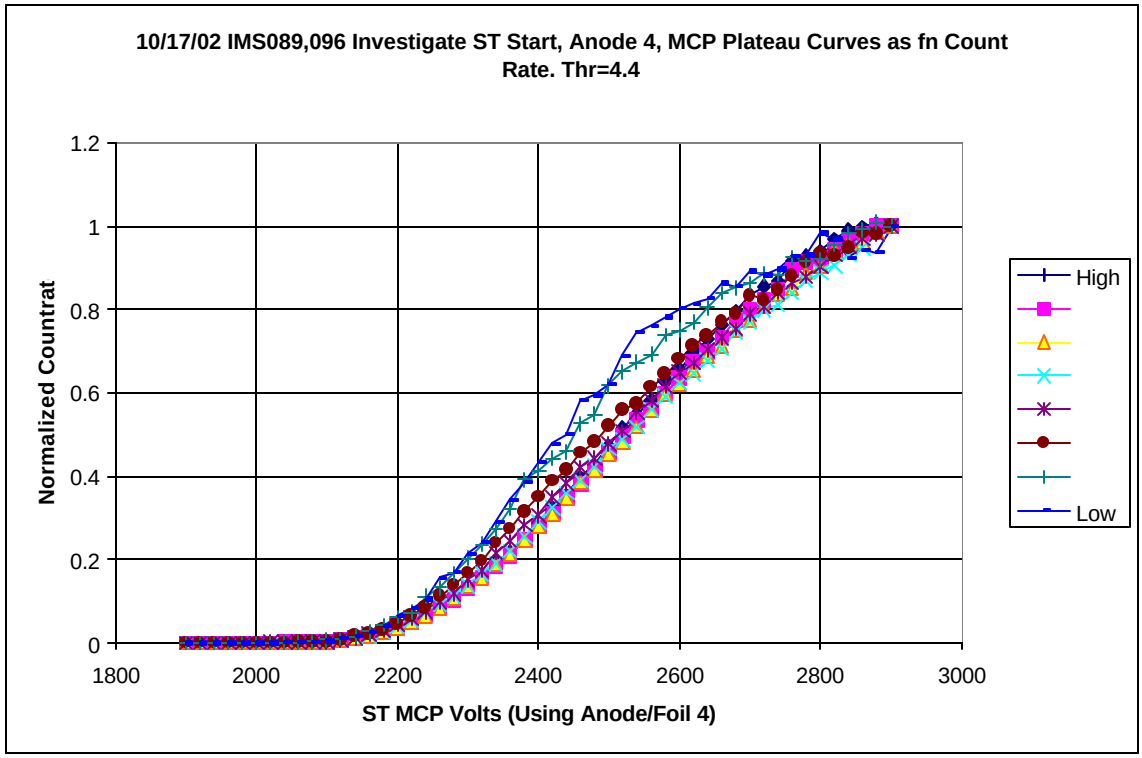


10/17/02 Plot 7, IMS085, 088 Effect on LEF Stop Plateau Curve with Direction Scan and Thresholds.

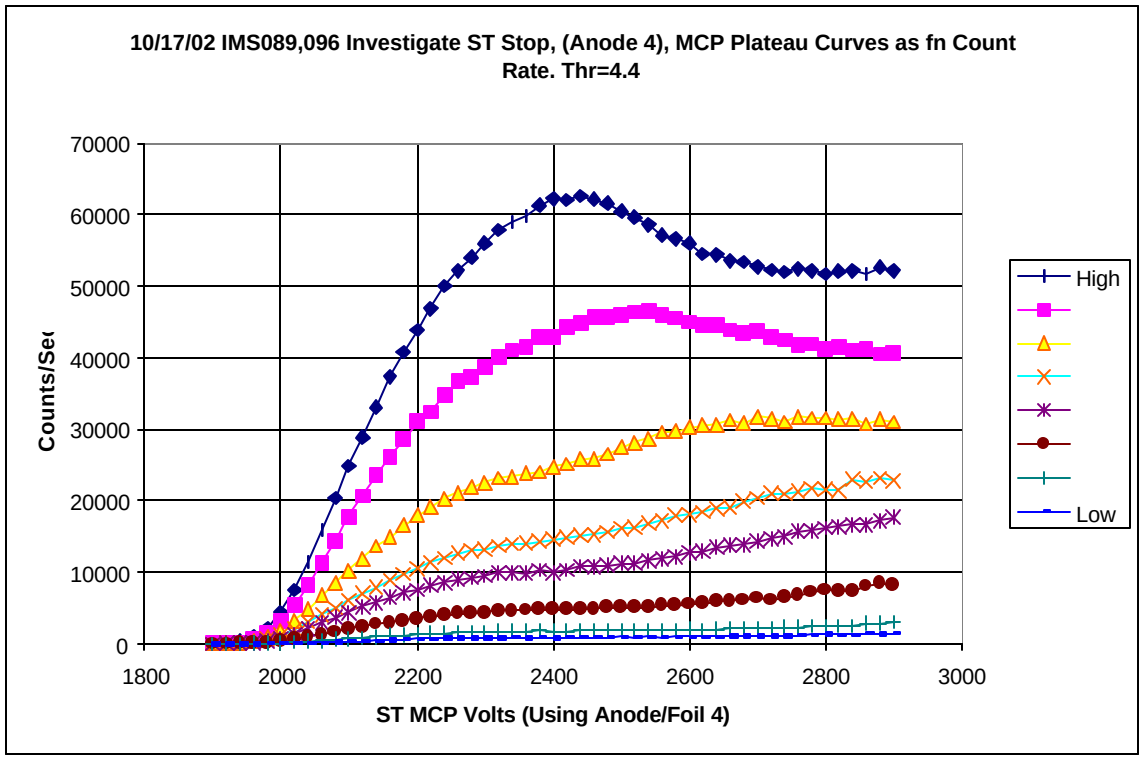


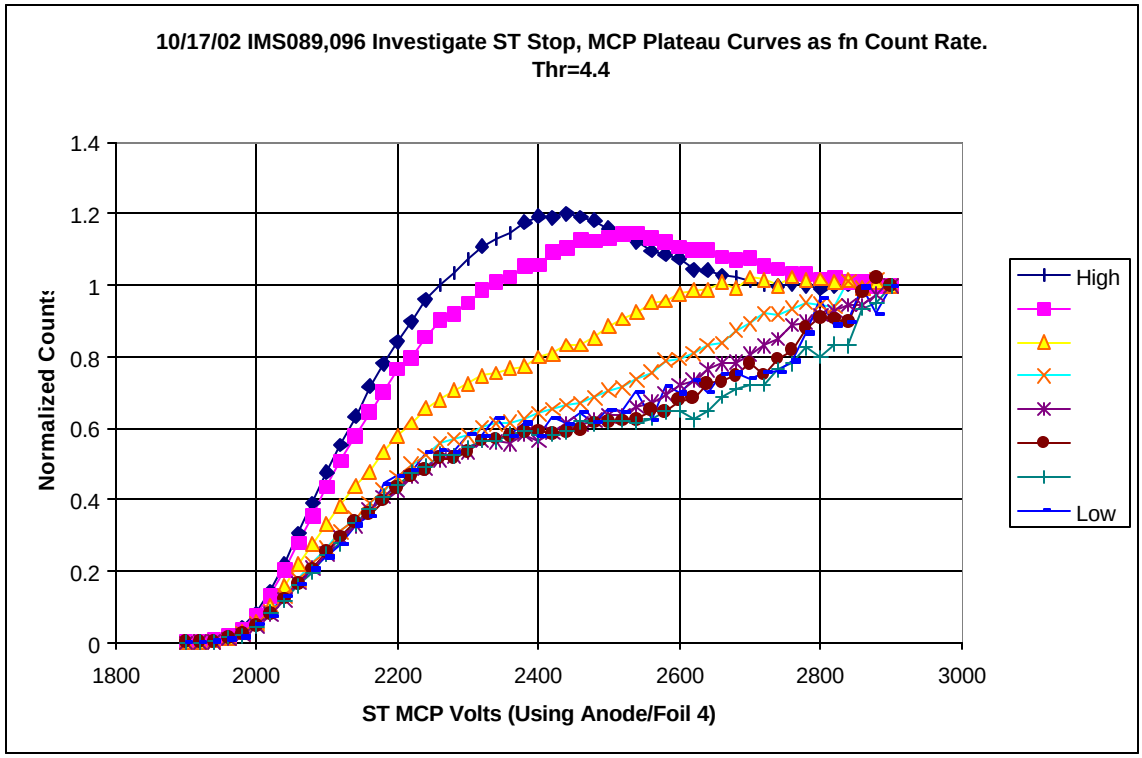
10/17/02 Plot 8a,b IMS089, 096 Effect on ST Start Plateau Curve with Beam Intensity



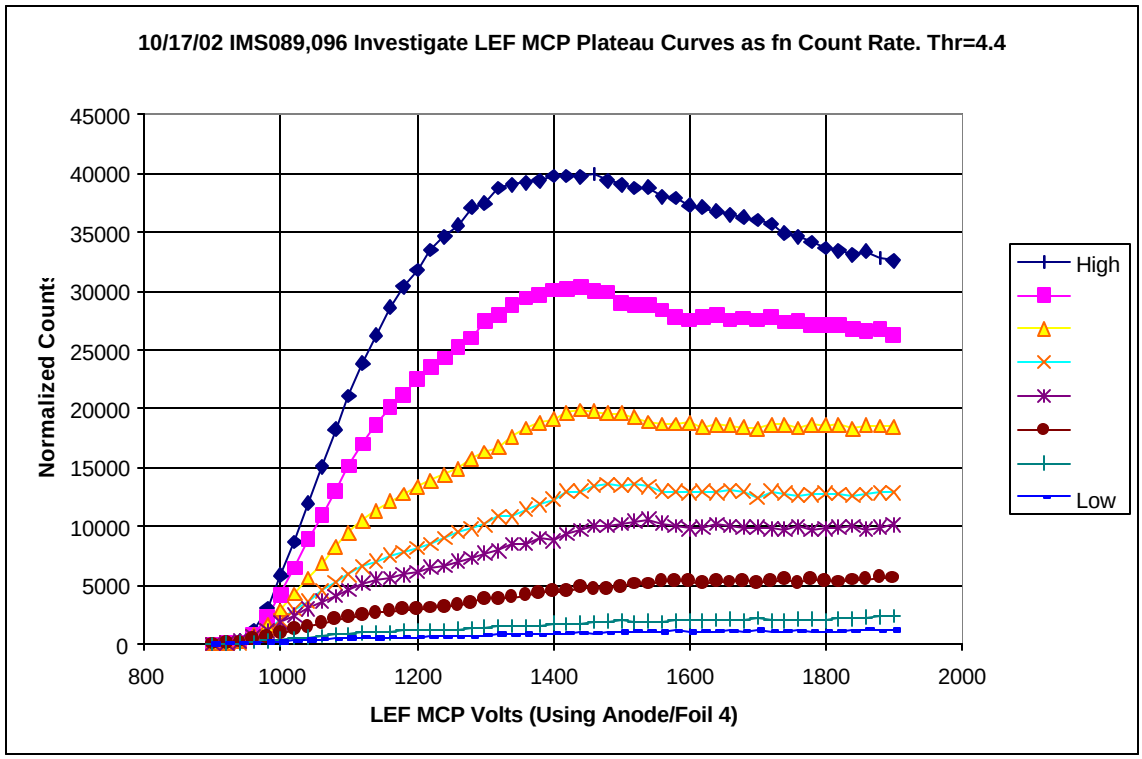


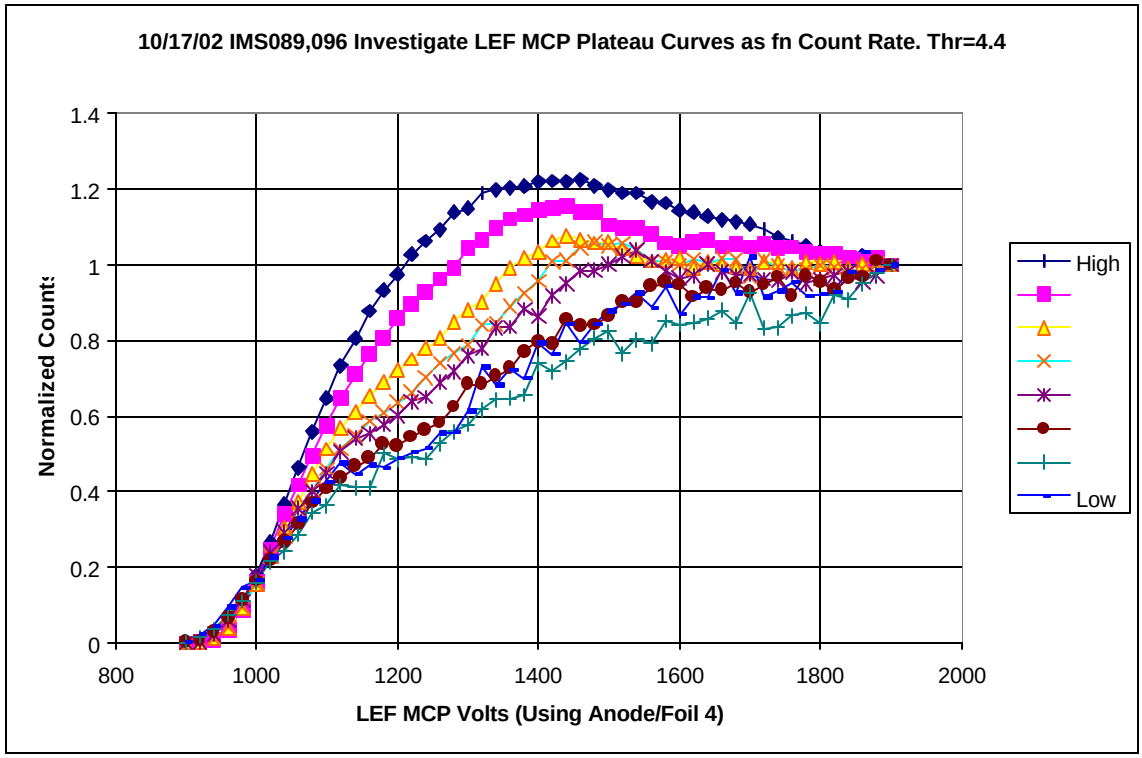
10/17/02 Plot 9a,b IMS089, 096 Effect on ST Stop Plateau Curve with Beam Intensity



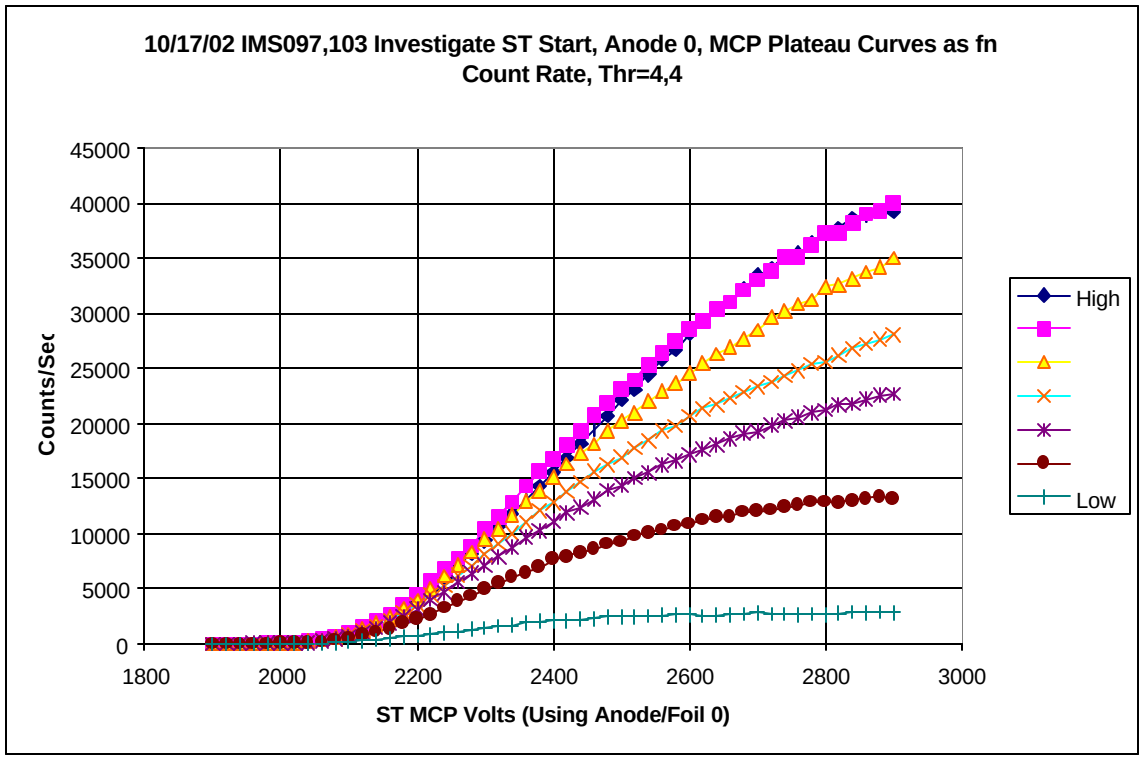


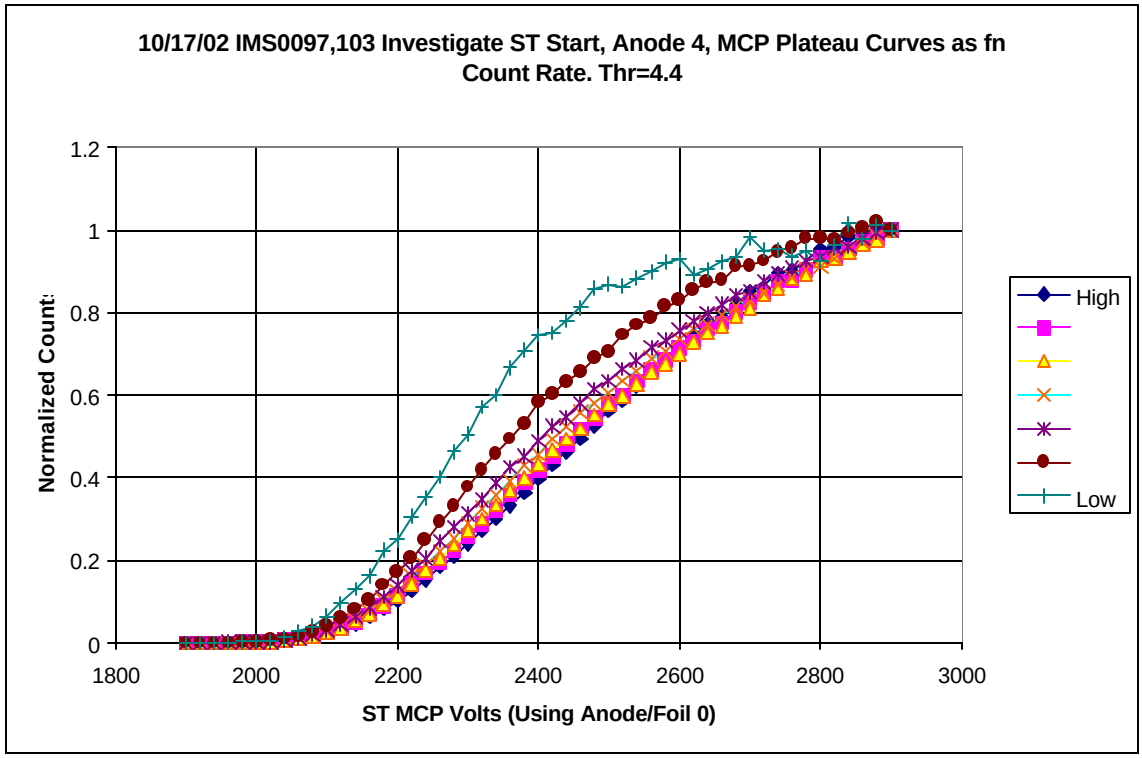
10/17/02 Plot 10a,b IMS089, 096 Effect on LEF Stop Plateau Curve with Beam Intensity



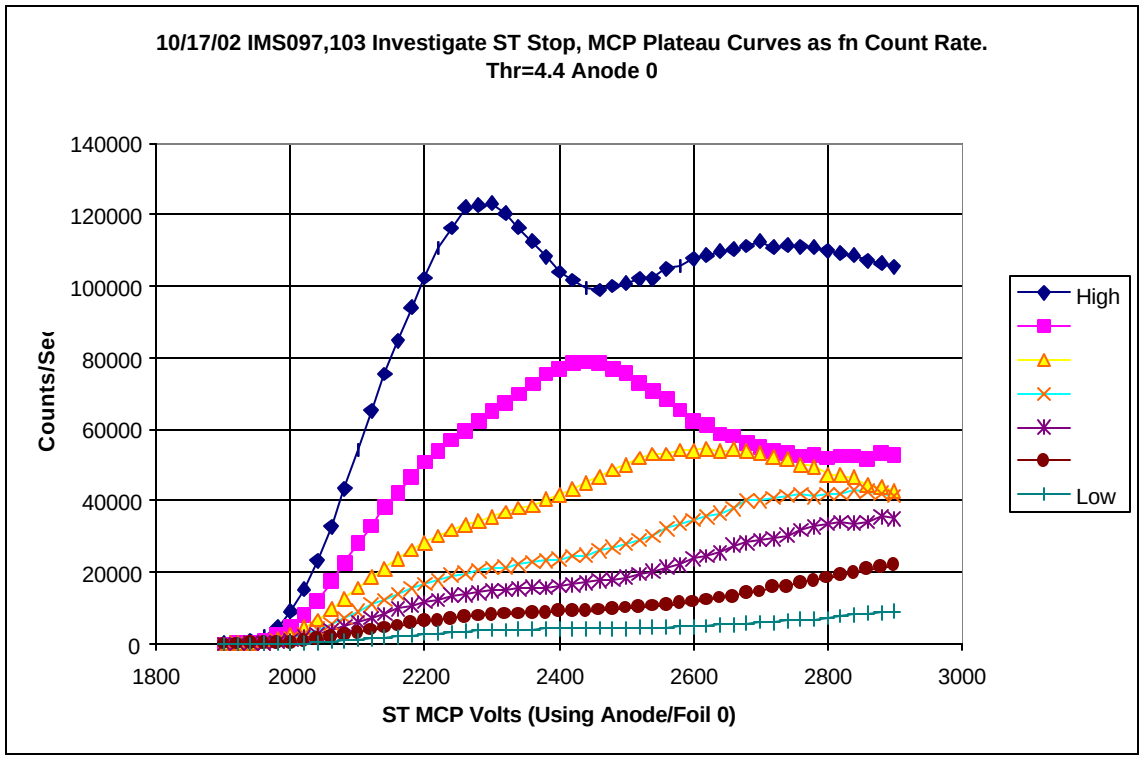


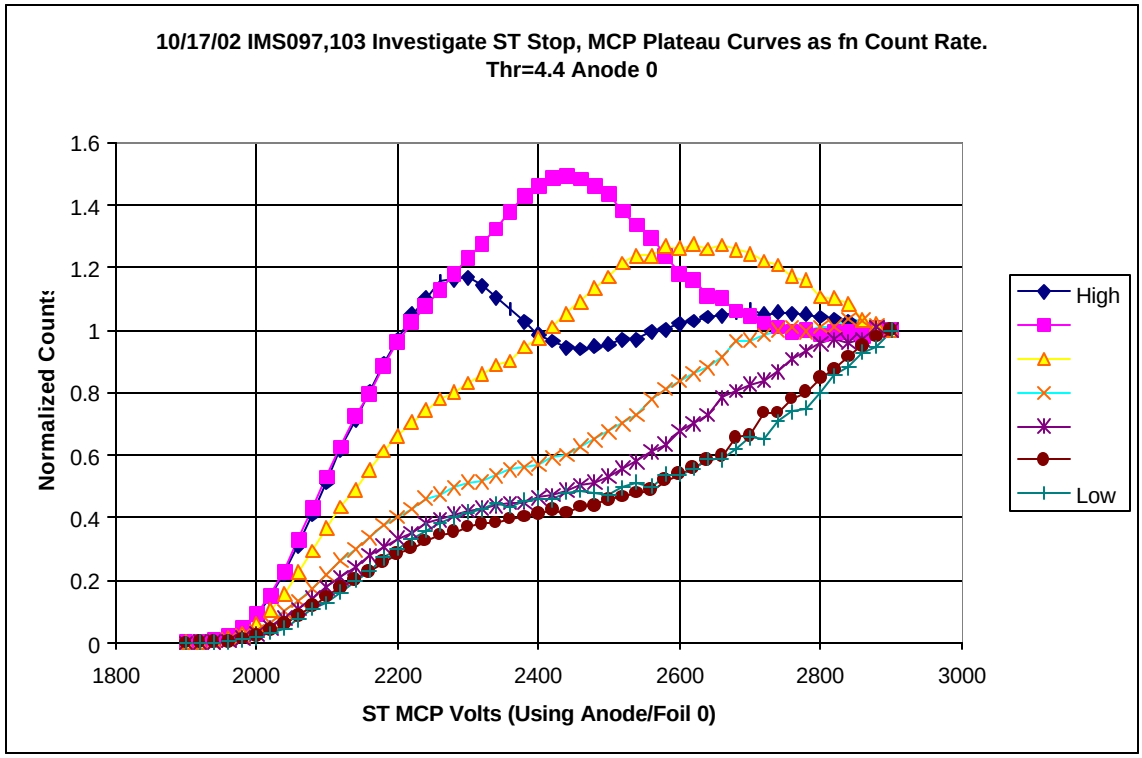
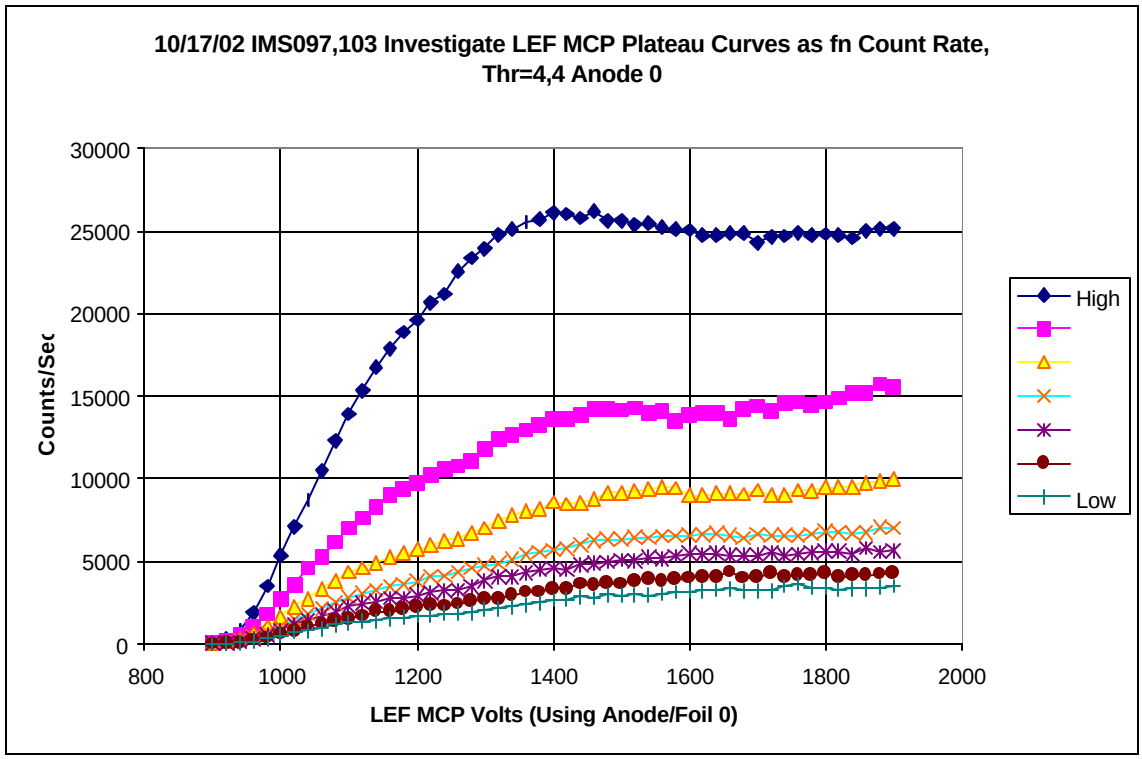
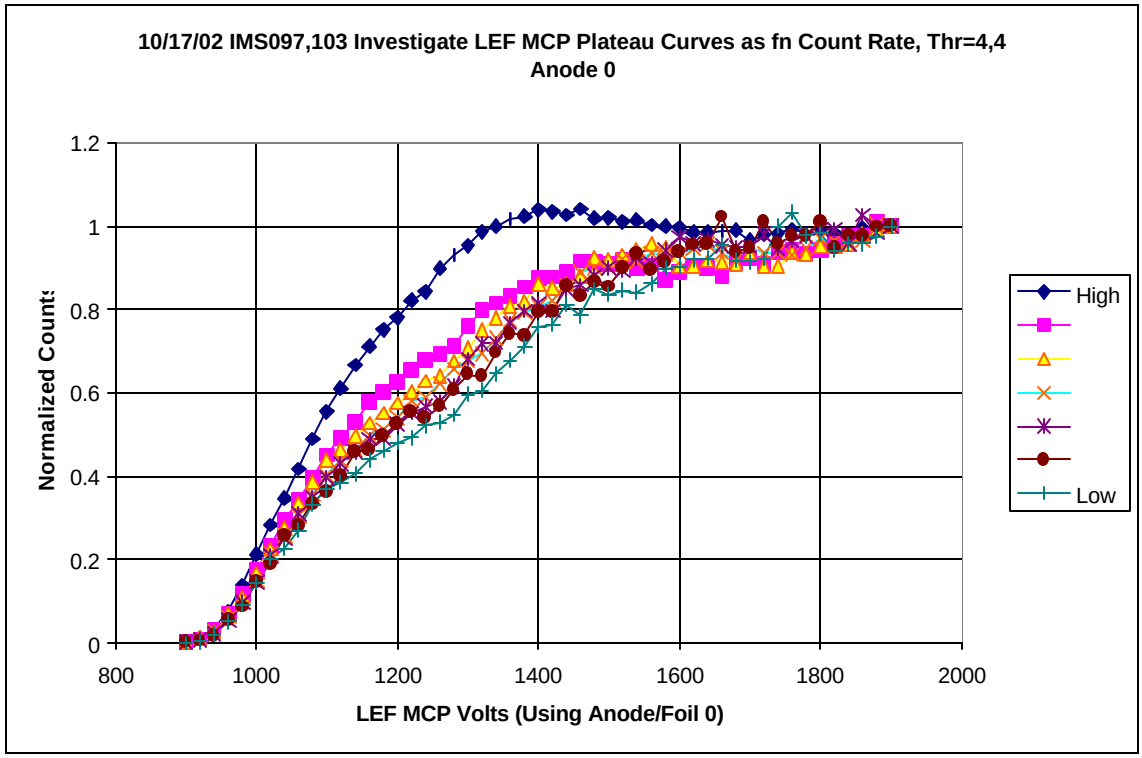
10/17/02 Plot 11a,b IMS097, 103 Effect on ST Start Plateau Curve with Beam Intensity





10/17/02 Plot 12a,b IMS097, 103 Effect on ST Stop Plateau Curve with Beam Intensity





10/17/02 Plot 13a,b IMS097, 103 Effect on LEF Start Plateau Curve with Beam Intensity