

## Recipe for AGS electron IPM

### START the program:

1. Open ags\_eIpm from StartUp/AGS Applications/ags\_eIpm.
2. The red “Acquire Data” is located at the top center position of the application (Fig. 1). The “Max” value is the number of AGS cycles for measurement. The “Interval” is the number of AGS cycles to be skipped for measurement. The value “1” for interval means that one cycle is for background measurement. Press “Acquire Data” to take manual measurement.

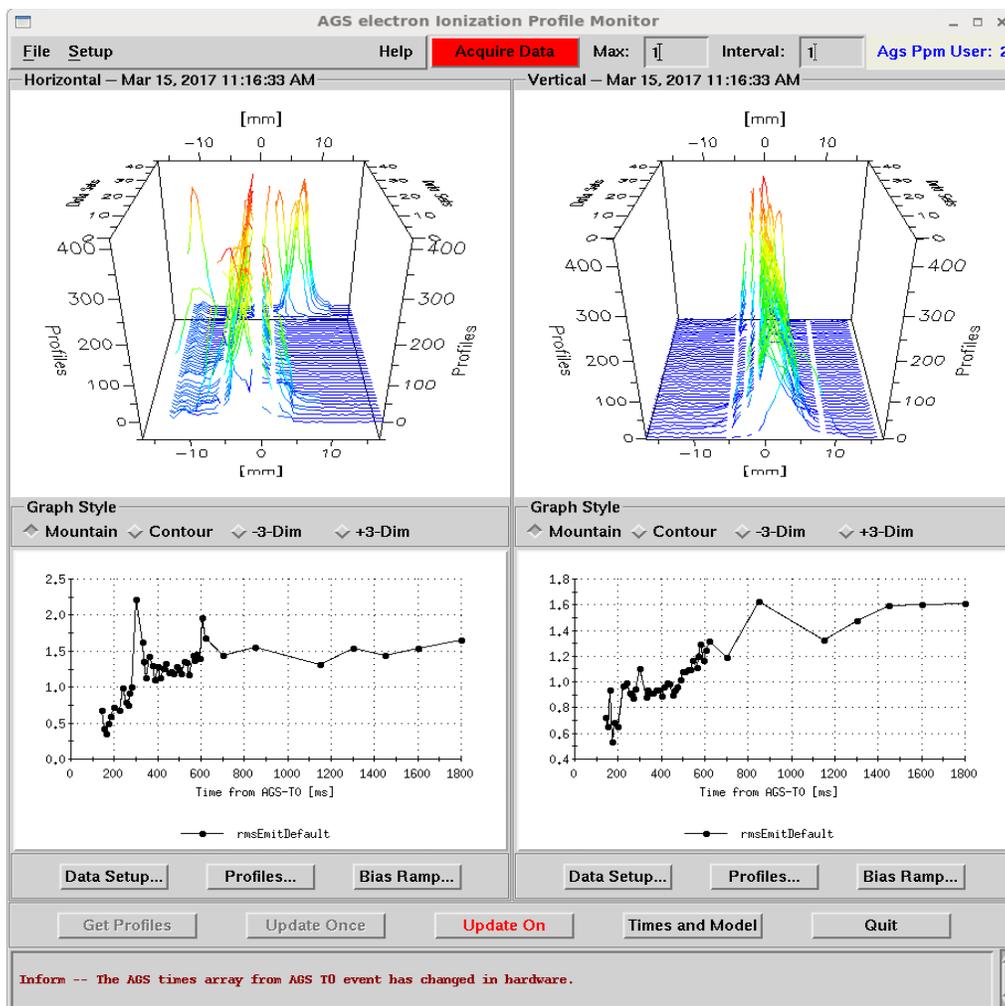


Fig. 1 AGS electron IPM main application, with “Acquire Data” on top, horizontal and vertical profiles in upper plots and emittances in lower plots.

**READ the results:**

1. The upper left plot shows the horizontal profiles in mountain range during a cycle. The upper right plot shows the vertical profiles in mountain range.
2. The lower left plot shows the horizontal normalized RMS emittance during a cycle. The lower right plot shows the vertical normalized RMS emittance during a cycle.
3. To show other data on the lower plots, go to “Data Setup” under the corresponding plot, select parameters or second axis. The “rmsEmitDefault” is the normalized RMS emittance calculated with a constant beta function of 22 m in both planes. The “rmsEmitMadx” is the normalized RMS emittance calculated with the beta functions from Madx model. The “rmsEmitCustom” is the normalized RMS emittance calculated with measured beta functions.

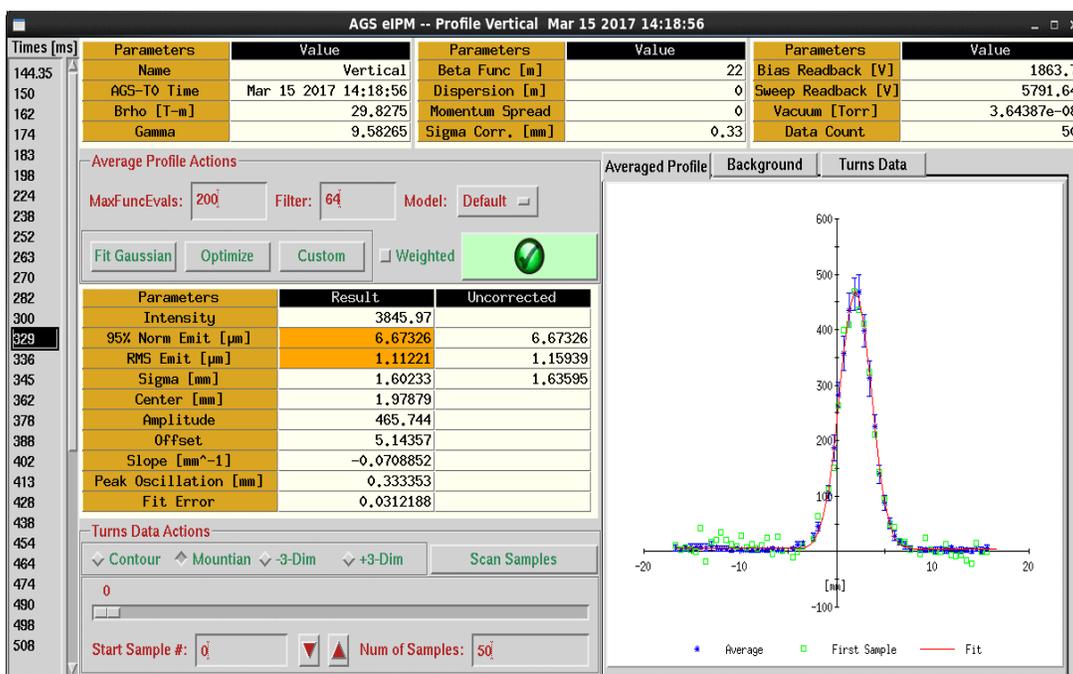


Fig. 2 Window for individual profiles, with times on the far left, parameters in the middle center, profile on the right.

4. To exam the individual profiles during the cycle, go to “Profiles” under the corresponding plot, click on the times (relative to AGS\_T0) which is listed on the left side of the window (Fig. 2). The green

check/red cross/question mark indicates the error of the Gaussian fitting.

5. To check injection oscillations, click time “144.35”, then click “Scan Samples”, then “Do Scan”. “Center Samples” shows the dipole/orbit oscillation. “Sigma Samples” shows the quadrupole/size oscillation.

### **Advanced configurations:**

1. Go to pull-down menu “Setup”->“Configurations” then the window (Fig. 3) will show up. To change Bias voltage, click the values then go to “Tools”->“Value Editor”, change the values and return.
2. For measurement without beam, change “Min AGS Early CBM” to 0.
3. Gas leak set points was set to “940” and stays.
4. Data count is the number of profiles taken to be averaged at a defined time.
5. To take out bad channels, change the “Filter Channels” value corresponding to that channel to “0”.
6. To manual adjust channel gain, change the “Channel Gains” value corresponding to that channel.
7. To implement static offsets, change the “Channel Offsets” value corresponding to that channel, which is to be added to the measured profiles.

### **Elog related to eIPMs:**

1. The frequently used display files are placed in LogView/Ags/Instrumentation/eIPM.
2. The logger related to eIPMs are placed in LogView/Ags/Instrumentation/IPM. They will be moved to LogView/Ags/Instrumentation/eIPM during shutdown in 2017.

AGS eIPM -- Configuration			
Page	PPM	Device	Data Tools Buffer Help
Description		Horizontal	Vertical
Data Acquisition		Stop	Stop
Min AGS Early CBM		500	500
Amplitude Level		500	500
Bias Volt [V]		[2000 1630 1630.]	[1860 1520 1520.]
Bias Ramp Time [ms]		200	200
Sweep Volt [V]		5999.02296043	5999.02296043
Gas Leak [V]		949.68246214	934.645823156
PS Auto		Enable	Enable
PS Control		SweepOnly	SweepOnly
Data Count		50	50
Data Count Extra		0	0
Data Start Turn		8	8
Turns Between Samples		1	1
Filter Channels		[0 0 0 0 0 0 0 0]	[1 1 1 1 1 1 1 1]
Channel Gains		[1 1 1 1 1..]	[1 0.99203326676]
Channel Offsets		[-16 -49 -73 -83]	[0 0 0 0 0 0 0 0]
Max Num Iterations		200	200
Filter Data For Ave		64	64
Sigma Correction [mm]		0.33	0.33
Weighted Gauss Fit		Disable	Disable
95% NormEmit [ $\pi \cdot \mu\text{m}$ ]		[14.9554605597..]	[2.82522621739..]
Fit Error		[0.0789425703536]	[0.0285189901886]
Peak Oscillation		[1.45092279602..]	[4.00125780724..]
Data Quality		[0 0 0 0 258 0]	[0 0 0 0 0 0 0 0]
Alpha		[0.684161245823.]	[0.105734929442.]
Beta [m]		[8.15235137939..]	[43.9196548462..]
Dispersion [m]		[-2.48848867416.]	[0.589886426926.]
Momentum Spread		[0 0 0 0 0 0 0 0]	[0 0 0 0 0 0 0 0]
Brho [T-m]		[7.02358351091..]	[7.02358351091..]
Gamma		[2.45686421413..]	[2.45686421413..]
Vacuum [Torr]		4.205e-08	3.665e-08

(20,2) ags\_elpmMan.horiz:sigmaCorrectionS Nudge: 1 901

Wed Mar 15 14:27:12 2017: Closing Pet Window.  
Wed Mar 15 14:39:06 2017: Get and Async requests complete.

Fig. 3 AGS eIPM configuration window