

# ToF-AMS DAQ Software

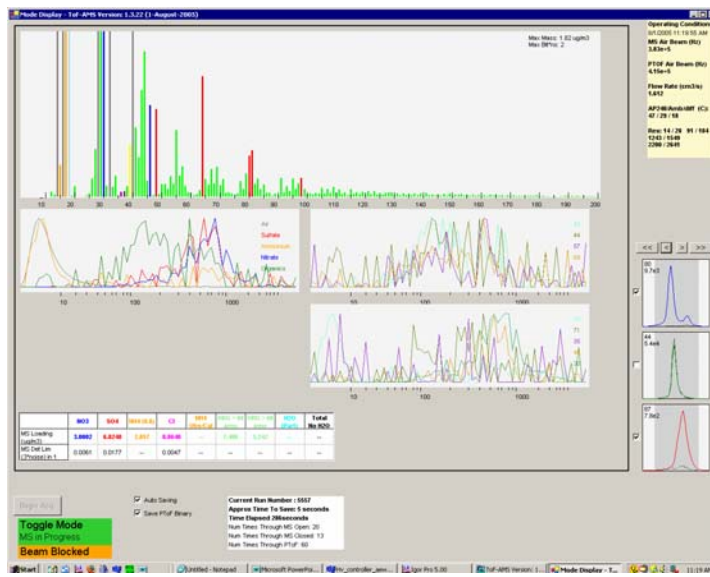
Peter DeCarlo

27-August-05

## Brief Software History

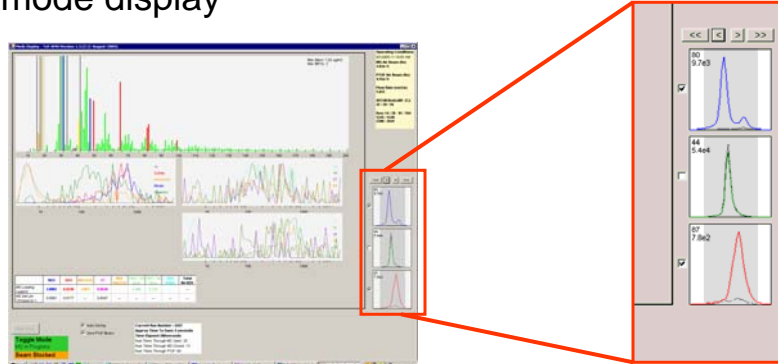
- Version 0.1: January 2004
  - Igor + Acqiris Live
  - MS Only
- Version 0.2: C-Code January 2004
  - Marc Gonin of ToFWerk
  - No Displays PToF Only
- Version 0.3 C-Code January 2004
  - MS/PToF
  - No Displays
- Version 1 VB.NET
  - Displays
  - MS, PToF, (BFSP)
  - Currently v. 1.3.26
  - Releases are 1.3.0, 1.4.0... expect for custom changes (1.3.16)
- Joel Kimmel taking over coding duties this Fall with my support (*hint: direct requests to him*)

- Because most ToF users are former Quad Users
- Trying to keep stuff similar to the Quad
  - Some keys “L” “N” “Q”
  - Up Arrow -> Page up
  - Down Arrow -> Page Down
- Improve when we can
  - Same window for PToF and MS displays!



## Current Software Improvements

- Soon to be released (v1.4)
  - Multiple Menu support
  - “Video Game” windows in the bottom of the mode display



## Current Software Imp. (cont.)

- Brute Force Single Particle Mode (BFSP)
  - Still not fully tested
  - A bridge to a better method
    - Hard-wired threshold optional
  - Frank saved 100 Gb this summer
  - Test before you use, or you can fill your HD really fast!
- Transient directory Writing
  - Erase or not (automatic backup)
- Save on Fixed Grid (5 min = :00, :05, :10)

## Main To-Do list

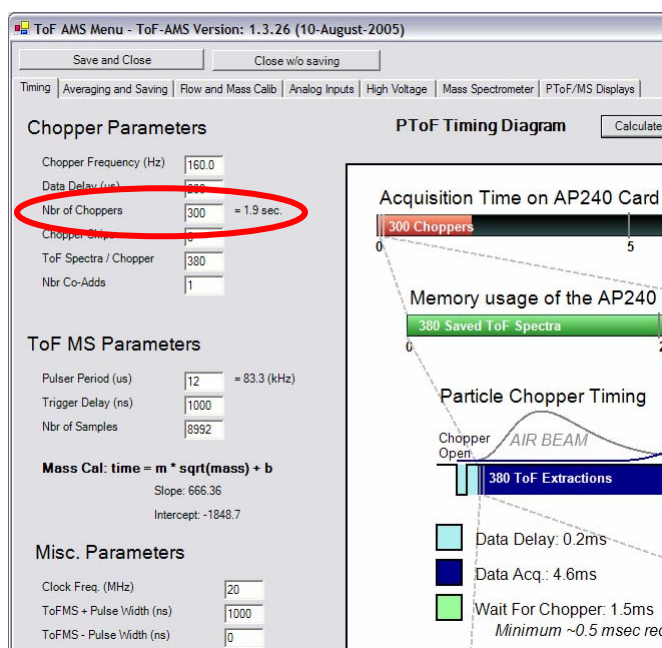
- IE Calibration Routine
  - CPC counts?
  - Single Particle Routine?
  - Both?
- Chopper Top Hat Calibration
- Data saved in HDF Format
  - Retain capability for .itx files
- Some Display Updates
- Software control of ToF Voltages!!
- TADC mode
- 2<sup>nd</sup> Channel (also for light scattering)

## Known Issues

- 300 Chopper average...
- PToF MS Offset
  - 100 – 50 ns
  - Hardware (Timer card) issue.
  - 1 tick of a 20 MHz clock
  - Software fix?
- Cell Phone Pick up

It is recommended that the number of choppers averaged on the Data Acquisition card not be greater than 300 for typical ambient sampling.

Averaging more than 300 could artificially broaden the particle size distribution.



## Software Requests

- New Features
- Detailed list of requirements are asked for
  - Full list of functionality
  - Detailed behavior you want
  - Written in an email
- Finding a bug
  - Details of Software Version Number, operating system
  - Mode the instrument was running in, copy of menu
  - Written in an email
- Reality:
  - The software team is made up of a post-doc and a PhD. student. As such we ask for advance notice if a particular software feature is required. We have many other projects right now and often will be unable to code new features quickly.

## Example Emails: Finding Bugs

- Finding a bug:
  - Bad Email:
    - “The software doesn't work. We're frustrated. -DW”
  - Good Email:

“I have been running the new mode and have found a few bugs.

    - 1.) When you switch between modes, the "save ptof binary" is unclicked on the screen, this also occurs when you begin the acquisition. It appears that the binary files are saved in spite of the bug.
    - 2.) A more concerning bug is that the PTOF airbeam varies by 1 to 2 orders of magnitude. The problems appear to occur when you switch between modes. The airbeam typically returns, but not until 1 or 2 saves have passed.
    - 3.) I have attached my menu files. In the second menu, I attempted to set timing parameters that would allow me to save at 20 second intervals. When I run in this mode, it appears to save at a 40 second interval for the first save, then it returns to 20 second intervals. Also, after the first save, the runs begin by showing 20 seconds elapsed time and 1 time through the PTOF. The 1 second MS menu appears to have no bugs which is exciting.”

## Comments, Questions, Requests

- Now?
- Later:
  - Email:
    - [joel.kimmel@colorado.edu](mailto:joel.kimmel@colorado.edu)
    - [peter.decarlo@colorado.edu](mailto:peter.decarlo@colorado.edu)
    - [jose.jimenez@colorado.edu](mailto:jose.jimenez@colorado.edu)