Current Status of AMS Software

Update on AMS Software Status

- Summary of AMS software developments since 2nd AMS User’s Meeting

  v.3.6.6 and v.3.6.9b  →  Current Version: V3.9.8 !!!

- Description of plans for future software upgrades

  Discussion of problems

  Suggestions for improvements for the software.
Modifications of Parameter Menu

Goal:
- Simplify Parameter menu by separating Menu Parameters that need to be changed often from those that are not changed often.

DEFAULT MENU contains:
- Critical “Factory Settings” that mostly need to be set properly only once, and then do not need to be changed often.
- Buttons for accessing modes of operation that are not the normal mode of operation,
- Parameters to enable troubleshooting of software

PARAMETER MENU contains:
- Parameters that need to be changed more often to operate the AMS (ex. Averaging and Saving, ).

NOTE:
- AMS Software versions 3.8.3 and up use Parameter Menu Version 3 (225 total parameters). These software versions will automatically convert the Parameter Menu Version 2 to Menu Version 3. HOWEVER, OLD VERSIONS CANNOT DO THE REVERSE!!!!!
- When updating to newer versions of the software always make a backup of the old menu versions- Also, in the logfiles directory, you can find menu.prm files saved according to date.
Mass Spec Window Display

Goals:
- Provide tools to help interpret the complex mass spectrum in real time.
- Work towards similar if not identical MS displays in both James Allan’s analysis program and the AMS Software.
  - Coloring of MS peaks according to Species (Sulfate, Nitrate, Water, Ammonium, Organic)
  - Calculation of nitrate equivalent mass loadings of the various species - this still needs to be refined to account for all interferences. Try to integrate reading of batch files used in James’ program into the AMS program.

Calibrations

Goal:
- Simplify/Clarify Calibration Procedures
  - Nitrate Ionization Efficiency Calibration
    - Calculate IPP based on Region 2 only
    - Enable calculation of IPP for individual fragments as well as species.
  - Quadrupole Mass/Resolution Calibration
    - Automated user friendly procedure
    - Stick intensity calibration done automatically around m/z 28 each time program saves.
AMS Operating Modes

Goal:
Used to acquire AMS field data in a non-standard way

- Eddy Correlation Mode: Synchronize averaging of TOF data w/ acquisition of 10 Hz anemometer data. This currently works only for 1 TOF mass.

- Airplane Mode: Automates setting of menu parameters for airplane operation- Used during CalTech Twin-Otter measurement campaign.

- NYC Alternate Mode: Used to acquire 2 S MS/TOF data during mobile measurements. Limits time lost due to repeated stopping and starting of DAQ between TOF/MS.

Rapid Realtime Aerosol Size Distributions
4 sec data rate

Collection Efficiencies

Diesel

Asphalt

Queens Surface Corp.
07/16/01 14:14:34

07/16/01 14:42:52
Doug: “By George, we’ve got it!”

Light Scattering Mode

Saving of Data

Heirarchical Data Format (HDF):
- Data saved in binary format/file
- Data divided into 5 gps (TOF, MS, Run, Mode, SP) and saved each group with different frequency
- Data saved as matrices, can extract whatever data you want without having to read in sequence.
- Implemented partially for Eddy Correlation Mode
  \[\text{Will be important as #Files Saved Increases}\]

Save Control Via Digital Signals:
- Saves on every change of digital state of specified line. Data averaged after specified delay.
Future Updates

- Continue to try and simplify displays/labels so that user can easily find important information/operating parameters.
- Computer-controlled ramping of Oven temperature
- Jump-MS Mode
- Move to saving files in HDF format?
- Setting Menu Parameters via files/ Macro language
- Integrated Mode to allow for switching between the various operating methods.

Questions

How do we deal with the software as user base grows?

- Open Source Code

  *Over 1000 pages of code when printed- Would be hard to support changes!*

- Separate Programs that interact w/ AMS Software

  *Temperature controlled inlet, switching between valves in prophet, Movable Wire*

- Specialized Modules that are integrated into software.

  *NYC Alternate Mode, Eddy Correlation*