AMS Training Agenda

Day 1

- General overview of instrument
  - Theory of operation
  - Introduction to control electronics and major components
    - Computer and data boards
    - Quadrupole controller QMG422
    - Power Supply Box
    - Pump controller
    - Electronics

- General overview of data acquisition software
  - Description of operating modes
  - Program and data and directory structure

- Discussion of instrument calibrations
  - Particle Mass calibration
    - Ionization efficiency
    - Electron multiplier gain – Single Ion measurement
  - Air beam measurement
  - Quadrupole calibrations
    - Atomic mass scale
    - Resolution
    - Ionizer tuning
  - Chopper position calibration
  - Particle beam alignment
  - Particle size calibration
    - Sample flow
      - Pinhole inlet- inspection and assembly
    - Particle velocity

- Introduction to IGOR data analysis and display software
  - Manual saving of data and display by IGOR
  - Screen dumps PowerPoint

- Calibration of AMS Flow rate
  - Plot results in IGOR enter calibration into acquisition program

- Measure air beam
- Operation of AMS acquisition program and Igor

Day 2

Single Ion measurement of electron multiplier gain
Manual (detailed) calibration of electron multiplier
    Plot results in IGOR and enter into acquisition program
Automated electron multiplier calibration
Review air beam concept – *instrument figure of merit*

Quadrupole ionizer tuning
Quadrupole mass and resolution tuning
Determination of Ionization Efficiency – IE
    NH4NO3 single particle calibration
        Manual determination of ions per particle (IPP)
        Automated IPP and IE - *shift M procedure*

Setup acquisition for alternate mode sampling with auto saving
    Record data over night

Day 3

Check of Instrument performance
    Data record
    Air Beam value
Introduction to IGOR AMS data analysis program
Particle beam alignment procedure

Chopper position calibration
Setup acquisition for alternate mode sampling with auto saving
    Record overnight data
Plot data from previous night using IGOR analysis program

Day 4

Check of Instrument performance
- Data record
- Air Beam value

Particle velocity calibration - Part 1
- NH4NO3 mobility diameter and PSLs

Chopper zero-offset measurement

Plot velocity calibration data in IGOR, enter fit results into acquisition program
Plot chopper zero-offset measurements in IGOR
Setup acquisition for alternate mode sampling with auto saving
- Record overnight data

IGOR analysis of AMS data

Day 5

Check of Instrument performance
- Data record
- Air Beam value

Troubleshooting procedures
- Faraday cup measurement of ion current
- Measuring ionizer voltages
- QMG 422 configuration
- Emission protect level

- Vacuum interlock system
- Chopper servo drive signal
- Turbo pump diagnostics – Navigator software
- Spare parts
- Follow-up discussion

Discussion of spare parts
Discussion of maintenance
Safety Considerations