Environnement et Changement climatique Canada
Environment and Climate Change Canada

Aerosol Optical Depth File Creation SOP for the Brewer Spectrometer

The Canadian Brewer Spectrometer Network

Réseau Canadian de spectrophotometric – Brewer

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Version 2.1

Canada

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2017

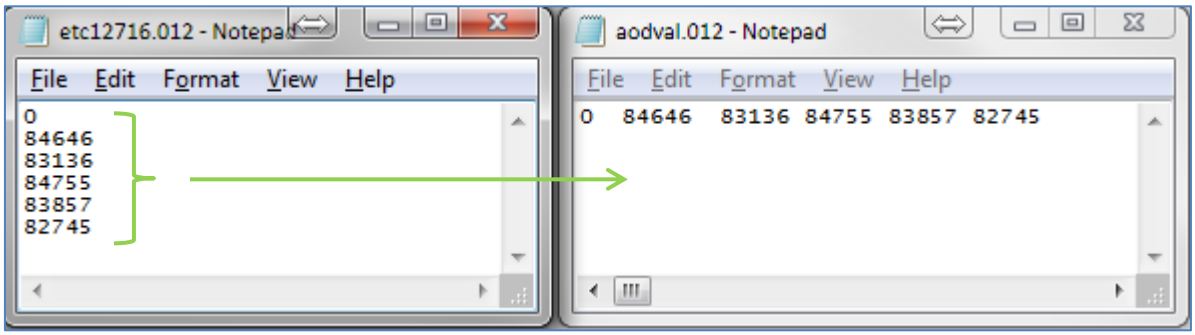
Aerosol Optical Depth

Aerosol optical depth (AOD) is a measure of the extinction of the solar beam by dust and haze. In other words, particles in the atmosphere (dust, smoke, pollution) can block sunlight by absorbing or by scattering light. AOD tells us how much direct sunlight is prevented from reaching the ground by these aerosol particles. It is a dimensionless number that is related to the amount of aerosol in the vertical column of atmosphere over the observation location. [1]
A value of 0.01 corresponds to an extremely clean atmosphere, and a value of 0.4 would correspond to a very hazy condition.[1]
Note: Environment and Climate Change Canada (ECCC) uses BfilePro to process the collected instrument data. BFilePro is a software created by International Ozone Services (IOS) Inc. ECCC has access to BFilePro via a license from IOS Inc.

Configure Brewer to determine AOD

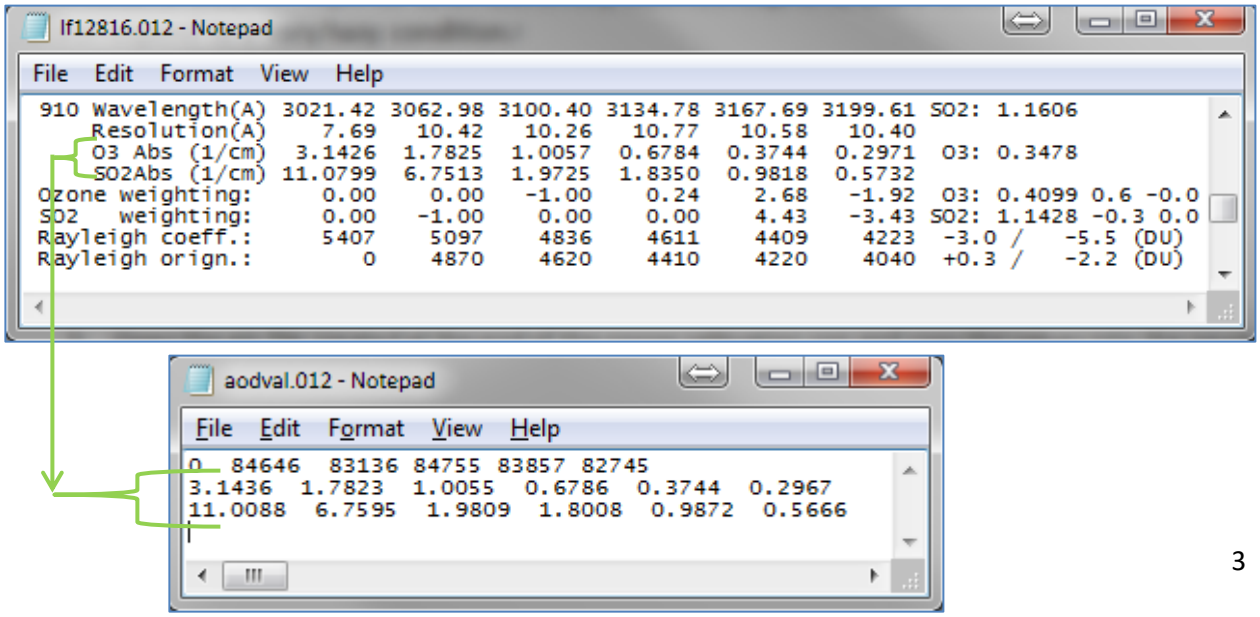
Building on the Ozone Calibration SOP the AOD can be determined by completing the following steps.

1. Create a blank notepad file named aodval.xxx (xxx is the serial number of the brewer being configured) and save this notepad in the instruments constants directory.
2. Open the etc file created at the end of the ozone calibration SOP and copy these values into the

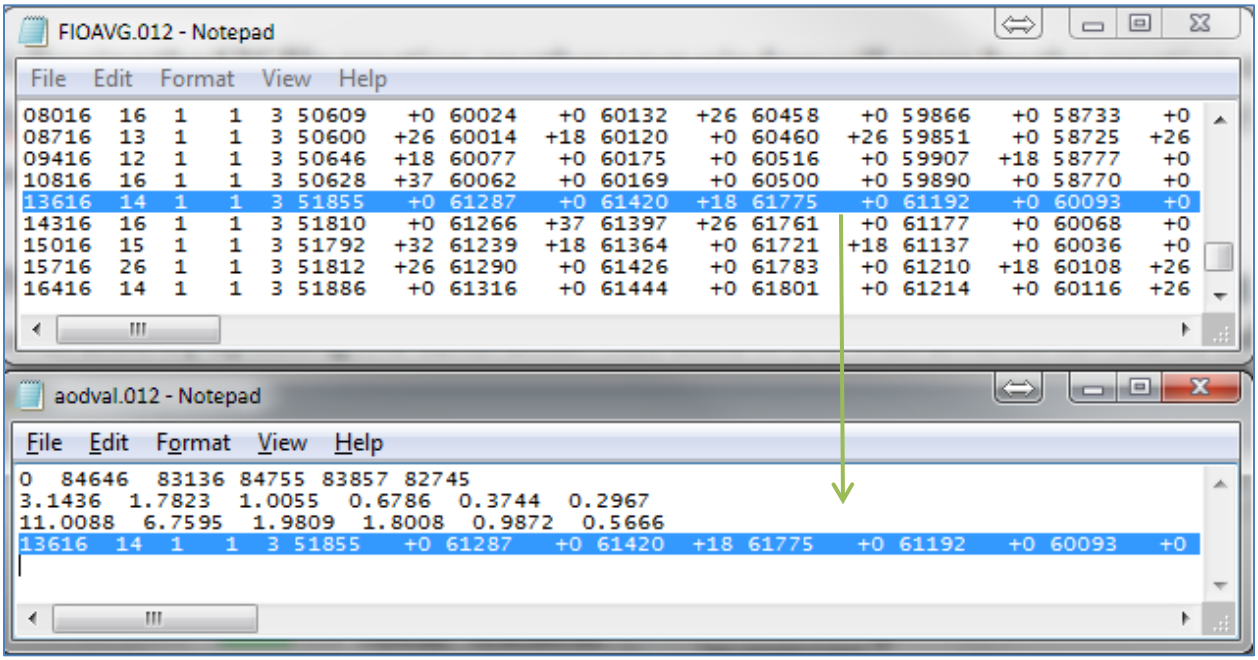


newly created aodval file.

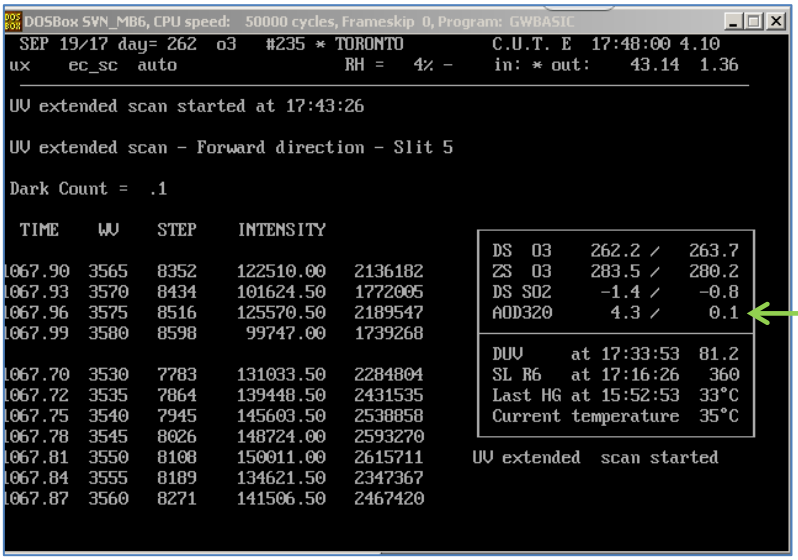
3. Open the dispersion line fit file that corresponds to the dispersion file currently in use by the Brewer. Scroll to the line fit information corresponding to the current calibration step in use. Copy the O3 abs and SO2 abs lines into the aodval file.



4. Open the Brewer being configured FIOAVG file. Copy a line that is after the calibration and ICF file dates into the aodval file.

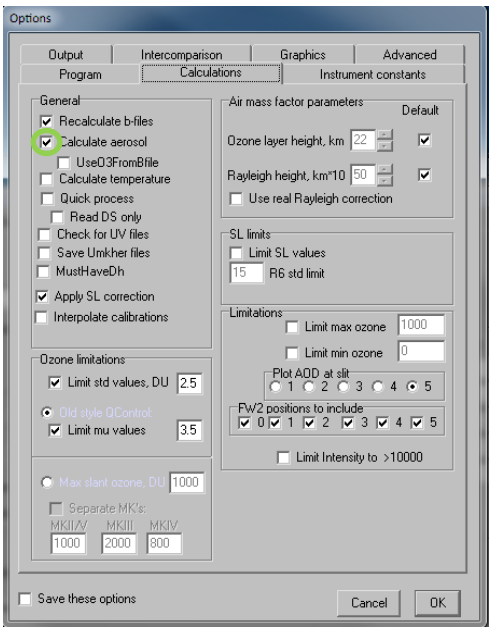


5. Save the aodval file into the Brewers current constants directory.
6. Following the next completed ds measurement an AOD320 heading will populate the summary results field.

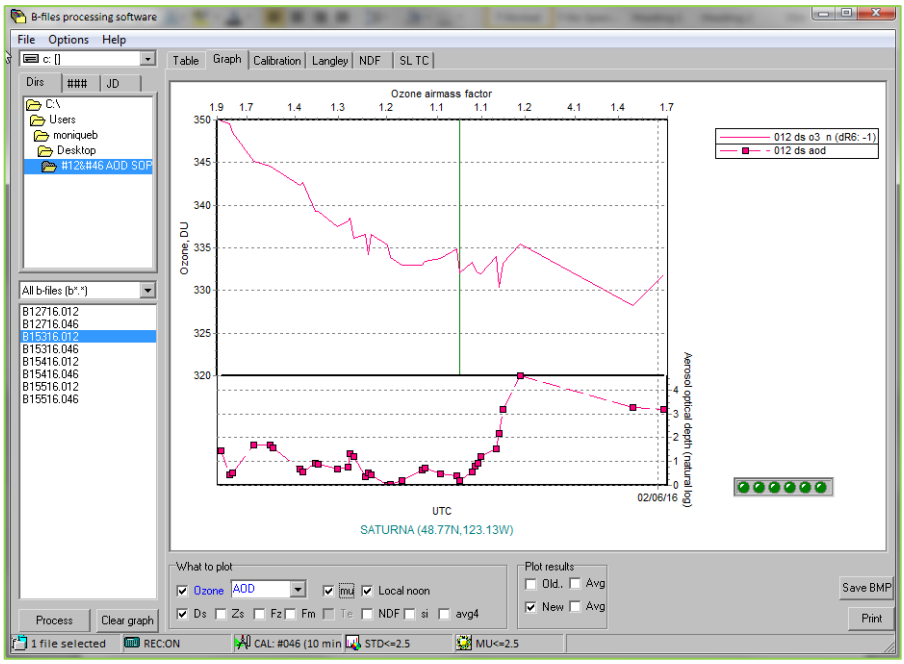


Viewing AOD plots

7. Open BFilePro to activate the B-files processing software and click Options and then the calculations tab. Check the Calculate aerosol option.
8. Next click on the Output tab and check the Aerosol option in the ds tab. Select the output directory of choice. Click OK.



9. Navigate to the data directory containing the BFile/s to be analyzed. In the drop down window beside Ozone select AOD.
10. Highlight the Bfile/s and click process. The AOD plot for the date/s chosen will be displayed in the lower portion of the graph.



Ref [1] : https://www.esrl.noaa.gov/gmd/grad/surfrad/aod/