

Operation of Brewer Instruments at Mauna Loa Observatory

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Two Brewer instruments continue to make measurements at the Mauna Loa Observatory (MLO) in support of the Brewer Instrument World Calibration Centre at the Meteorological Service of Canada (MSC) site in Downsview, Ontario [Kerr *et al.*, 2000]. A single monochromator (instrument no. 9) and a double monochromator (instrument no. 119) have been measuring direct solar, zenith sky and global ultraviolet radiation on most days during 1998 and 1999. The instruments are programmed and controlled from Downsview, where the data are sent automatically on a daily basis, and routine maintenance and calibrations are carried out by staff on site. One of the Brewer reference triad instruments (instrument no. 8) was brought to MLO for calibration in March-April 1999, and comparison with the onsite instruments simplified the calibration process.

The instruments routinely measure total ozone, ozone profile (Umkehr measurements), sulfur dioxide, aerosol optical depth, the extraterrestrial solar spectrum (via daily airmass extrapolations of direct solar spectra) and global UV irradiance spectra. In addition, a new scanning technique was developed to determine the temperature of atmospheric ozone. Some

preliminary results of these measurements were reported at the Quadrennial Ozone Symposium in Sapporo [Kerr, 2000].

Brewer instrument no. 9 includes an all-sky camera that records and stores images of the sky every 10 minutes. These images are displayed on the MLO Web site and are useful for obtaining real time information regarding the sky conditions at MLO. They are also valuable for reviewing sky conditions at times when unusual events are noticed in the data set. For example, large values of sulfur dioxide have been observed (particularly between January and March) on several occasions, and the sky images assist in determining the cause of these events.

REFERENCES

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Kerr, J.B., C.T. McElroy, D.I. Wardle, and T.S. Grajnar, The Brewer instrument calibration centre 1984-2000, *Proc., Quad. Ozone Symp.*, Sapporo, Japan, 177-178, 2000.