**Ozone Measurement Types**

Scientists have been measuring ozone since the 1920s, and since then the instruments have evolved. There are several methods of measuring it nowadays, from ground based spectrometers to balloons, aircraft, rockets, and satellites.

![Image 1. The primary methods used for ozone measurement](http://www.albany.edu)

**Ozone depletion and reconstitution process**

A single CFC molecule can destroy 100,000 ozone molecules.

\[
\text{CFC3 + UV Light} \rightarrow \text{CFC2 + Cl} \\
\text{Cl + O3} \rightarrow \text{ClO + O2} \\
\text{ClO + O} \rightarrow \text{Cl + O2}
\]

The atomic Cl is again free to destroy another ozone molecule.

![Figure 1. The formation of ozone from oxygen by sunlight (Wikimedia Commons).](http://www.meteoschweiz.admin.ch)

**Our method for measuring ozone concentration**

We fly a modified ECC Ozonesonde, which is designed to detect ozone molecules by utilizing a chemical cell that reacts with a dilute solution of potassium iodide to produce a weak electrical current proportional to the ozone concentration of the sampled air. We have preflight tested the system in a vacuum chamber and do system performance tests before every flight. Calibration methods are being developed.

![Figure 5. Data acquisition and analysis process (diagram by Dr. H.Volmer).](http://www.meteoschweiz.admin.ch)

**Abstract**

Although well publicized, measurements of Earth’s ozone layer are actually very limited. We have assembled a system to fly an ozonesonde along with other instrumentation into the stratosphere with the goal of measuring ozone to approximately 35km above sea level. We currently have a live telemetry system that relies on the sound card of the computer being used, which varies in efficiency from one computer to another. We are working on replacing that method by using a modem. The ozonesonde SNR is being tested by assessing possible changes in the geometry and length of its current antenna for better transmission. Our last season’s flights data is comparable to the one provided to us by NASA HASP in October 2012. Results, current methodology being used and status of systems and antenna testing will be presented in details.

![Figure 6. ECC Ozonesonde (picture by Dr. H.Volmer).](http://www.meteoschweiz.admin.ch)

**Results from 2012 season flight and tests performed in lab**

![Figure 7. August 2012 data collected with our instrumentation. Red line = flight up, Brown line = return to Earth.](http://www.meteoschweiz.admin.ch)

**In situ measurement of stratospheric ozone above Utah’s Uintah Basin**

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