

Atmospheric overburden from the CDM Altitude Data for the CREAM-I Flight

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There were 5 pressure sensors in CDM with different sensitivity ranges: Sensors 1 and 2 for 1-10 Torr, Sensors 3 and 4 for 1 – 100 Torr, and sensor 5 for 1 – 1000 Torr. Data from sensors 1 and 2 for 1 – 10 Torr are used for this calculation.

The CDM did not record measured pressure values, but rather the converted altitude values in their electronics. The following equation provided by Wallops shows the relationship between the pressure (x) in Torr and altitude (y) in ft.

$$y = -143.08493885 * (\ln(x))^3 + 1529.87589648 * (\ln(x))^2 - 26412.52293079 * (\ln(x)) + 150480.10745042$$

The data format is as following:

- ◆ Column 1: Date
- ◆ Column 2: Time (GMT)
- ◆ Column 3: Altitude (ft) from pressure sensor 1
- ◆ Column 4: Altitude (ft) from pressure sensor 2
- ◆ Column 5: Atmospheric overburden (g/cm^2) using pressure sensor 1 data
- ◆ Column 6: Atmospheric overburden (g/cm^2) using pressure sensor 2 data