

README: START08 1-second merged data file

Documentation updated 24 April 2013

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For Campaign information, visit NCAR ACD START08 Page: <http://www.acd.ucar.edu/start/>

This dataset contains netCDF data files that hold selected variables from the NCAR Gulfstream V (GV) aircraft, instrument observations, and large-scale meteorological variables interpolated in space and time from high-resolution NCEP Global Forecast System (GFS) 6-hourly global analyses. Variables are given at 1-second time resolution for the duration of each flight.

The files also include a number of derived variables, such as equivalent latitude, potential temperature lapse rate (stability), temperature at the tropopause, etc. The equivalent latitude suffers from ambiguities when the isentropic surface of interest intersects the ground. Therefore, the eqlat_GFS variable has attributes listing the theta surfaces on which it was computed and the amount of missing data on each surface. This can be used as a measure of the reliability of the equivalent latitude.

Merging of the in situ data is performed directly for instruments with 1 Hz data rate (1 second per sample). For instruments with lower sampling rate (UCATS instrument, 70 and 140 s) the data are merged at the central time of the sample window.

For further details of the in situ chemical data, see the payload 2-pagers of each instrument at: <http://www.acd.ucar.edu/start/instruments.shtml>.

Additionally, chemical tracers included in the merge are listed in the Table on the following page along with each variable's data rate, primary investigator, and data status, if applicable. An ncdump of a sample merge file is also given on the pages following the table that lists every variable in the merge.

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START08 / PreHIPPO USER Instrument Data Table

Species/ Instrument	Data rate (sec)	Notes	PI
O3 NOAA	1		Ballard, Gao
O3 NCAR	1		Andrew J. Weinheimer
NO NCAR	1		Andrew J. Weinheimer
NOy NCAR	1		Andrew J. Weinheimer
CO RAF	1		Teresa Campos
H2O RAF	1	No data for RF04 and RF05	Teresa Campos
IWC CLH	1	No data for RF02	Linnea Avallone
SID ICE	1	No data for RF08	Andy Heymsfield
H2O VXL	1	No data for RF01, RF02, and RF03	Mark Paige, Mark Zondlo
CO2 QCLS	1	No data for RF01, RF02, and RF03	Steve Wofsy
CO QCLS	1	No data for RF01, RF02, RF03, RF04, RF05, RF11, and RF13	Steve Wofsy
CH4 QCLS	1	No data for RF01, RF02, RF03, RF04, RF05, and RF11	Steve Wofsy
N2O QCLS	1	No data for RF01, RF02, RF03, RF04, RF05, and RF11	Steve Wofsy
O2 AO2	1	No data for RF04, RF08, and RF09. All other data interim	Britton Stephens
CO2 AO2	1	No data for RF04, RF08, and RF09. All other data interim	Britton Stephens
H2O UCATS	1		Dale Hurst
O3 UCATS	10		Dale Hurst
CO UCATS	140	No data for RF02	Dale Hurst
H2 UCATS	140	No data for RF02	Dale Hurst
CH4 UCATS	140	No data for RF02	Dale Hurst
N2O UCATS	70	No data for RF02	Dale Hurst
SF6 UCATS	70	No data for RF02	Dale Hurst

NCDUMP of sample file

```
netcdf start08_rf01_merged_final_v05 {
dimensions:
    date_string = 20 ;
    Time = UNLIMITED ; // (25561 currently)
variables:
    int Time(Time) ;
        Time:long_name = "time of measurement" ;
        Time:standard_name = "time" ;
        Time:units = "seconds since 2008-04-18 14:58:00 +0000" ;
    float LONC(Time) ;
        LONC:_FillValue = NaNf ;
        LONC:units = "degree_E" ;
        LONC:long_name = "GPS-Corrected Inertial Longitude" ;
        LONC:valid_range = -180.f, 180.f ;
        LONC:Category = "Position" ;
        LONC:standard_name = "longitude" ;
        LONC:DataQuality = "Good" ;
        LONC:Dependencies = "1 LATC" ;
        LONC:coordinate_system = "WGS84" ;
    float LATC(Time) ;
        LATC:_FillValue = NaNf ;
        LATC:units = "degree_N" ;
        LATC:long_name = "GPS-Corrected Inertial Latitude" ;
        LATC:valid_range = -90.f, 90.f ;
        LATC:Category = "Position" ;
        LATC:standard_name = "latitude" ;
        LATC:DataQuality = "Good" ;
        LATC:Dependencies = "11 LAT LON GGLAT GGLON VNS VEW GGVNS GGVEW ROLL GGNSAT GGSTATUS" ;
        LATC:coordinate_system = "WGS84" ;
    float GGALT(Time) ;
        GGALT:_FillValue = NaNf ;
        GGALT:units = "m" ;
        GGALT:long_name = "Reference GPS Altitude (MSL)" ;
        GGALT:Category = "Position" ;
        GGALT:standard_name = "altitude" ;
        GGALT:SampledRate = 1 ;
        GGALT:DataQuality = "Good" ;
    float PSXC(Time) ;
        PSXC:_FillValue = NaNf ;
        PSXC:units = "hPa" ;
        PSXC:long_name = "Corrected Static Pressure, Reference" ;
        PSXC:Category = "Atmos. State" ;
        PSXC:standard_name = "air_pressure" ;
        PSXC:DataQuality = "Good" ;
```

```
float PALT(Time) ;
    PALT:_FillValue = NaNf ;
    PALT:units = "m" ;
    PALT:long_name = "NACA Pressure Altitude" ;
    PALT:Category = "Position" ;
    PALT:standard_name = "altitude" ;
    PALT:DataQuality = "Good" ;
float PALTF(Time) ;
    PALTF:_FillValue = NaNf ;
    PALTF:units = "feet" ;
    PALTF:long_name = "NACA Pressure Altitude" ;
    PALTF:Category = "Position" ;
    PALTF:standard_name = "altitude" ;
    PALTF:DataQuality = "Good" ;
float UIC(Time) ;
    UIC:_FillValue = NaNf ;
    UIC:units = "m/s" ;
    UIC:long_name = "GPS-Corrected Wind Vector, East Component" ;
    UIC:Category = "Wind" ;
    UIC:standard_name = "eastward_wind" ;
    UIC:DataQuality = "Good" ;
float VIC(Time) ;
    VIC:_FillValue = NaNf ;
    VIC:units = "m/s" ;
    VIC:long_name = "GPS-Corrected Wind Vector, North Component" ;
    VIC:Category = "Wind" ;
    VIC:standard_name = "northward_wind" ;
    VIC:DataQuality = "Good" ;
float WIC(Time) ;
    WIC:_FillValue = NaNf ;
    WIC:units = "m/s" ;
    WIC:long_name = "GPS-Corrected Wind Vector, Vertical Gust Component" ;
    WIC:Category = "Wind" ;
    WIC:standard_name = "upward_air_velocity" ;
    WIC:DataQuality = "Good" ;
float WSC(Time) ;
    WSC:_FillValue = NaNf ;
    WSC:units = "m/s" ;
    WSC:long_name = "GPS-Corrected Horizontal Wind Speed" ;
    WSC:Category = "Wind" ;
    WSC:standard_name = "wind_speed" ;
    WSC:DataQuality = "Good" ;
float WDC(Time) ;
    WDC:_FillValue = NaNf ;
    WDC:units = "degree_T" ;
    WDC:long_name = "GPS-Corrected Horizontal Wind Direction" ;
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WDC:Category = "Wind" ;
WDC:standard_name = "wind_from_direction" ;
WDC:DataQuality = "Good" ;
float ATX(Time) ;
ATX:_FillValue = NaNf ;
ATX:units = "deg_C" ;
ATX:long_name = "Ambient Temperature, Reference" ;
ATX:Category = "Atmos. State" ;
ATX:standard_name = "air_temperature" ;
ATX:DataQuality = "Good" ;
float TASX(Time) ;
TASX:_FillValue = NaNf ;
TASX:units = "m/s" ;
TASX:long_name = "Aircraft True Airspeed, Reference" ;
TASX:Category = "Aircraft State" ;
TASX:standard_name = "platform_speed_wrt_air" ;
TASX:DataQuality = "Good" ;
float THETA(Time) ;
THETA:_FillValue = NaNf ;
THETA:units = "K" ;
THETA:long_name = "Potential Temperature" ;
THETA:Category = "Thermodynamic" ;
THETA:standard_name = "air_potential_temperature" ;
THETA:DataQuality = "Good" ;
float THETAE(Time) ;
THETAE:_FillValue = NaNf ;
THETAE:units = "K" ;
THETAE:long_name = "Equivalent Potential Temperature" ;
THETAE:Category = "Thermodynamic" ;
THETAE:DataQuality = "Good" ;
float THETA_V(Time) ;
THETA_V:_FillValue = NaNf ;
THETA_V:units = "K" ;
THETA_V:long_name = "Virtual Potential Temperature" ;
THETA_V:Category = "Thermodynamic" ;
THETA_V:DataQuality = "Good" ;
float DPXC(Time) ;
DPXC:_FillValue = NaNf ;
DPXC:units = "deg_C" ;
DPXC:long_name = "Dew Point Temperature, Reference" ;
DPXC:Category = "Atmos. State" ;
DPXC:standard_name = "dew_point_temperature" ;
DPXC:DataQuality = "Good" ;
float EDPC(Time) ;
EDPC:_FillValue = NaNf ;
EDPC:units = "hPa" ;
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EDPC:long_name = "Ambient Water Vapor Pressure, Reference" ;
EDPC:Category = "Thermodynamic" ;
EDPC:DataQuality = "Good" ;
float MR(Time) ;
MR:_FillValue = NaNf ;
MR:units = "gram/kg" ;
MR:long_name = "Mixing Ratio, T-Electric" ;
MR:Category = "Atmos. State" ;
MR:DataQuality = "Good" ;
float RHODR(Time) ;
RHODR:_FillValue = NaNf ;
RHODR:units = "gram/m3" ;
RHODR:long_name = "Absolute Humidity, T-Electric Right" ;
RHODR:Category = "Atmos. State" ;
RHODR:DataQuality = "Good" ;
float RHUM(Time) ;
RHUM:_FillValue = NaNf ;
RHUM:units = "%" ;
RHUM:long_name = "Relative Humidity" ;
RHUM:Category = "Atmos. State" ;
RHUM:DataQuality = "Good" ;
float SOLAZ(Time) ;
SOLAZ:_FillValue = NaNf ;
SOLAZ:units = "radian" ;
SOLAZ:long_name = "Solar Azimuth Angle" ;
SOLAZ:Category = "Derived" ;
SOLAZ:DataQuality = "Good" ;
SOLAZ:Dependencies = "1 SOLZE" ;
float SOLDE(Time) ;
SOLDE:_FillValue = NaNf ;
SOLDE:units = "radian" ;
SOLDE:long_name = "Solar Declination Angle" ;
SOLDE:Category = "Derived" ;
SOLDE:DataQuality = "Good" ;
SOLDE:Dependencies = "1 SOLZE" ;
float SOLEL(Time) ;
SOLEL:_FillValue = NaNf ;
SOLEL:units = "radian" ;
SOLEL:long_name = "Solar Elevation Angle" ;
SOLEL:Category = "Derived" ;
SOLEL:DataQuality = "Good" ;
SOLEL:Dependencies = "1 SOLZE" ;
float SOLZE(Time) ;
SOLZE:_FillValue = NaNf ;
SOLZE:units = "radian" ;
SOLZE:long_name = "Solar Zenith Angle" ;
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    SOLZE:Category = "Derived" ;
    SOLZE:DataQuality = "Good" ;
    SOLZE:Dependencies = "8 YEAR MONTH DAY HOUR MINUTE SECOND GGLAT GGLON" ;
char Time_ISO(Time, date_string) ;
    Time_ISO:long_name = "Date and time in ISO 8601 format" ;
    Time_ISO:units = "YYYY-MM-DD hh:mm:ss" ;
float u_GFS(Time) ;
    u_GFS:units = "m s-1" ;
    u_GFS:long_name = "U-component of the velocity" ;
    u_GFS:Category = "GFS analysis interpolated variable" ;
    u_GFS:missing_value = NaNf ;
float v_GFS(Time) ;
    v_GFS:units = "m s-1" ;
    v_GFS:long_name = "V-component of the velocity" ;
    v_GFS:Category = "GFS analysis interpolated variable" ;
    v_GFS:missing_value = NaNf ;
float w_GFS(Time) ;
    w_GFS:units = "hPa s-1" ;
    w_GFS:long_name = "W-component of the velocity" ;
    w_GFS:Category = "GFS analysis interpolated variable" ;
    w_GFS:missing_value = NaNf ;
float T_GFS(Time) ;
    T_GFS:units = "K" ;
    T_GFS:long_name = "Temperature" ;
    T_GFS:Category = "GFS analysis interpolated variable" ;
    T_GFS:missing_value = NaNf ;
float theta_GFS(Time) ;
    theta_GFS:units = "K" ;
    theta_GFS:long_name = "Potential temperature" ;
    theta_GFS:Category = "GFS analysis interpolated variable" ;
    theta_GFS:missing_value = NaNf ;
float hgt_GFS(Time) ;
    hgt_GFS:units = "m" ;
    hgt_GFS:long_name = "Geopotential height" ;
    hgt_GFS:Category = "GFS analysis interpolated variable" ;
    hgt_GFS:missing_value = NaNf ;
float SH_GFS(Time) ;
    SH_GFS:units = "kg kg-1" ;
    SH_GFS:long_name = "Specific humidity" ;
    SH_GFS:Category = "GFS analysis interpolated variable" ;
    SH_GFS:missing_value = NaNf ;
float pv_GFS(Time) ;
    pv_GFS:units = "s-1" ;
    pv_GFS:long_name = "Potential vorticity" ;
    pv_GFS:Category = "GFS analysis interpolated variable" ;
    pv_GFS:missing_value = NaNf ;

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    z_trop_GFS:Category = "GFS analysis interpolated variable" ;
    z_trop_GFS:missing_value = NaNf ;
float T_trop_GFS(Time) ;
    T_trop_GFS:units = "K" ;
    T_trop_GFS:long_name = "Temperature at the tropopause" ;
    T_trop_GFS:Category = "GFS analysis interpolated variable" ;
    T_trop_GFS:missing_value = NaNf ;
byte trop_type_GFS(Time) ;
    trop_type_GFS:long_name = "GFS Tropopause Type" ;
    trop_type_GFS:Category = "GFS analysis interpolated variable quality" ;
    trop_type_GFS:Description = "1 = Primary Tropopause, 2 = Secondary Tropopause or Indeterminate" ;
float z_trop2_GFS(Time) ;
    z_trop2_GFS:units = "m" ;
    z_trop2_GFS:long_name = "Geopotential height of the secondary tropopause" ;
    z_trop2_GFS:Category = "GFS analysis interpolated variable" ;
    z_trop2_GFS:Description = "Computed by Homeyer & Bowman using GFS analysis and WMO definition" ;
    z_trop2_GFS:missing_value = NaNf ;
float p_trop2_GFS(Time) ;
    p_trop2_GFS:units = "Pa" ;
    p_trop2_GFS:long_name = "Pressure at the secondary tropopause" ;
    p_trop2_GFS:Category = "GFS analysis interpolated variable" ;
    p_trop2_GFS:Description = "Computed by Homeyer & Bowman using GFS analysis and WMO definition" ;
    p_trop2_GFS:missing_value = NaNf ;
float z_pv2_GFS(Time) ;
    z_pv2_GFS:units = "m" ;
    z_pv2_GFS:long_name = "Geopotential height of the 2.0 pvu surface" ;
    z_pv2_GFS:Category = "GFS analysis interpolated variable" ;
    z_pv2_GFS:missing_value = NaNf ;
float p_pv2_GFS(Time) ;
    p_pv2_GFS:units = "hPa" ;
    p_pv2_GFS:long_name = "Pressure at the 2.0 pvu surface" ;
    p_pv2_GFS:Category = "GFS analysis interpolated variable" ;
    p_pv2_GFS:missing_value = NaNf ;
float theta_pv2_GFS(Time) ;
    theta_pv2_GFS:units = "K" ;
    theta_pv2_GFS:long_name = "Potential temperature at the 2.0 pvu surface" ;
    theta_pv2_GFS:Category = "GFS analysis interpolated variable" ;
    theta_pv2_GFS:missing_value = NaNf ;
float z_pv4_GFS(Time) ;
    z_pv4_GFS:units = "m" ;
    z_pv4_GFS:long_name = "Geopotential height of the 4.0 pvu surface" ;
    z_pv4_GFS:Category = "GFS analysis interpolated variable" ;
    z_pv4_GFS:missing_value = NaNf ;
float p_pv4_GFS(Time) ;
    p_pv4_GFS:units = "hPa" ;
    p_pv4_GFS:long_name = "Pressure at the 4.0 pvu surface" ;

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p_pv4_GFS:Category = "GFS analysis interpolated variable" ;
p_pv4_GFS:missing_value = NaNf ;
float theta_pv4_GFS(Time) ;
theta_pv4_GFS:units = "K" ;
theta_pv4_GFS:long_name = "Potential temperature at the 4.0 pvu surface" ;
theta_pv4_GFS:Category = "GFS analysis interpolated variable" ;
theta_pv4_GFS:missing_value = NaNf ;
float z_pv8_GFS(Time) ;
z_pv8_GFS:units = "m" ;
z_pv8_GFS:long_name = "Geopotential height of the 8.0 pvu surface" ;
z_pv8_GFS:Category = "GFS analysis interpolated variable" ;
z_pv8_GFS:missing_value = NaNf ;
float p_pv8_GFS(Time) ;
p_pv8_GFS:units = "hPa" ;
p_pv8_GFS:long_name = "Pressure at the 8.0 pvu surface" ;
p_pv8_GFS:Category = "GFS analysis interpolated variable" ;
p_pv8_GFS:missing_value = NaNf ;
float theta_pv8_GFS(Time) ;
theta_pv8_GFS:units = "K" ;
theta_pv8_GFS:long_name = "Potential temperature at the 8.0 pvu surface" ;
theta_pv8_GFS:Category = "GFS analysis interpolated variable" ;
theta_pv8_GFS:missing_value = NaNf ;
float CO_RAF(Time) ;
CO_RAF:long_name = "RAF Carbon Monoxide" ;
CO_RAF:units = "ppbv" ;
CO_RAF:missing_value = NaNf ;
CO_RAF:operating_status = "Operating" ;
float NO_NCAR(Time) ;
NO_NCAR:long_name = "NCAR Nitric Oxide" ;
NO_NCAR:units = "pptv" ;
NO_NCAR:missing_value = NaNf ;
NO_NCAR:operating_status = "Operating" ;
float NOY_NCAR(Time) ;
NOY_NCAR:long_name = "NCAR NOy" ;
NOY_NCAR:units = "pptv" ;
NOY_NCAR:missing_value = NaNf ;
NOY_NCAR:operating_status = "Operating" ;
float O3_NCAR(Time) ;
O3_NCAR:long_name = "NCAR Ozone" ;
O3_NCAR:units = "ppbv" ;
O3_NCAR:missing_value = NaNf ;
O3_NCAR:operating_status = "Operating" ;
float O3_NOAA(Time) ;
O3_NOAA:long_name = "NOAA Ozone" ;
O3_NOAA:units = "ppbv" ;
O3_NOAA:missing_value = NaNf ;
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O3_NOAA:operating_status = "Operating" ;
float H2O_UCATS(Time) ;
H2O_UCATS:long_name = "UCATS Water Vapor" ;
H2O_UCATS:units = "ppm" ;
H2O_UCATS:missing_value = NaNf ;
H2O_UCATS:operating_status = "Operating" ;
float IWC_CLH(Time) ;
IWC_CLH:long_name = "CLH Ice Water Content" ;
IWC_CLH:units = "ppmv" ;
IWC_CLH:missing_value = NaNf ;
IWC_CLH:operating_status = "Operating" ;
float H2O_NumDensi_VXL(Time) ;
H2O_NumDensi_VXL:long_name = "VXL Water Vapor Number Density" ;
H2O_NumDensi_VXL:units = "molecules cm^-3" ;
H2O_NumDensi_VXL:missing_value = NaNf ;
H2O_NumDensi_VXL:operating_status = "Not Operating" ;
float DewPoint_VXL(Time) ;
DewPoint_VXL:long_name = "VXL Dew Point Temperature" ;
DewPoint_VXL:units = "degrees Celsius" ;
DewPoint_VXL:missing_value = NaNf ;
DewPoint_VXL:operating_status = "Not Operating" ;
float H2O_VXL(Time) ;
H2O_VXL:long_name = "VXL Water Vapor" ;
H2O_VXL:units = "ppmv" ;
H2O_VXL:missing_value = NaNf ;
H2O_VXL:operating_status = "Not Operating" ;
float CO2_QCLS(Time) ;
CO2_QCLS:long_name = "QCLS Carbon Dioxide" ;
CO2_QCLS:units = "ppmv" ;
CO2_QCLS:missing_value = NaNf ;
CO2_QCLS:operating_status = "Not Operating" ;
float CH4_QCLS(Time) ;
CH4_QCLS:long_name = "QCLS Methane" ;
CH4_QCLS:units = "ppbv" ;
CH4_QCLS:missing_value = NaNf ;
CH4_QCLS:operating_status = "Not Operating" ;
float N2O_QCLS(Time) ;
N2O_QCLS:long_name = "QCLS Nitrous Oxide" ;
N2O_QCLS:units = "ppbv" ;
N2O_QCLS:missing_value = NaNf ;
N2O_QCLS:operating_status = "Not Operating" ;
float CO_QCLS(Time) ;
CO_QCLS:long_name = "QCLS Carbon Monoxide" ;
CO_QCLS:units = "ppbv" ;
CO_QCLS:missing_value = NaNf ;
CO_QCLS:operating_status = "Not Operating" ;
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float SID_ICE(Time) ;
  SID_ICE:long_name = "SID Liquid Water Content" ;
  SID_ICE:units = "g m^-3" ;
  SID_ICE:missing_value = NaNf ;
  SID_ICE:operating_status = "Operating" ;
float SID_Mean_Dia(Time) ;
  SID_Mean_Dia:long_name = "SID Mean Diameter" ;
  SID_Mean_Dia:units = "um" ;
  SID_Mean_Dia:missing_value = NaNf ;
  SID_Mean_Dia:operating_status = "Operating" ;
float SID_Num_Con(Time) ;
  SID_Num_Con:long_name = "SID Total Number Concentration" ;
  SID_Num_Con:units = "# cm^-3" ;
  SID_Num_Con:missing_value = NaNf ;
  SID_Num_Con:operating_status = "Operating" ;
float H2O_RAF(Time) ;
  H2O_RAF:long_name = "RAF Water Vapor" ;
  H2O_RAF:units = "ppmv" ;
  H2O_RAF:missing_value = NaNf ;
  H2O_RAF:operating_status = "Operating" ;
float O3_UCATS(Time) ;
  O3_UCATS:long_name = "UCATS Ozone" ;
  O3_UCATS:units = "ppb" ;
  O3_UCATS:missing_value = NaNf ;
  O3_UCATS:operating_status = "Operating" ;
float CO2_AO2(Time) ;
  CO2_AO2:long_name = "AO2 Carbon Dioxide" ;
  CO2_AO2:units = "ppm" ;
  CO2_AO2:missing_value = NaNf ;
  CO2_AO2:operating_status = "Operating" ;
float O2_AO2(Time) ;
  O2_AO2:long_name = "AO2 Oxygen" ;
  O2_AO2:units = "per meg" ;
  O2_AO2:missing_value = NaNf ;
  O2_AO2:operating_status = "Operating" ;
float N2O_UCATS(Time) ;
  N2O_UCATS:long_name = "UCATS Nitrous Oxide" ;
  N2O_UCATS:units = "ppb" ;
  N2O_UCATS:missing_value = NaNf ;
  N2O_UCATS:operating_status = "Operating" ;
float N2Oe_UCATS(Time) ;
  N2Oe_UCATS:long_name = "UCATS Nitrous Oxide Error" ;
  N2Oe_UCATS:units = "ppb" ;
  N2Oe_UCATS:missing_value = NaNf ;
  N2Oe_UCATS:operating_status = "Operating" ;
float SF6_UCATS(Time) ;
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SF6_UCATS:long_name = "UCATS Sulfur Hexaflouride" ;
SF6_UCATS:units = "ppt" ;
SF6_UCATS:missing_value = NaNf ;
SF6_UCATS:operating_status = "Operating" ;
float SF6e_UCATS(Time) ;
SF6e_UCATS:long_name = "UCATS Sulfur Hexaflouride Error" ;
SF6e_UCATS:units = "ppt" ;
SF6e_UCATS:missing_value = NaNf ;
SF6e_UCATS:operating_status = "Operating" ;
float H2_UCATS(Time) ;
H2_UCATS:long_name = "UCATS Hydrogen" ;
H2_UCATS:units = "ppb" ;
H2_UCATS:missing_value = NaNf ;
H2_UCATS:operating_status = "Operating" ;
float H2e_UCATS(Time) ;
H2e_UCATS:long_name = "UCATS Hydrogen Error" ;
H2e_UCATS:units = "ppb" ;
H2e_UCATS:missing_value = NaNf ;
H2e_UCATS:operating_status = "Operating" ;
float CH4_UCATS(Time) ;
CH4_UCATS:long_name = "UCATS Methane" ;
CH4_UCATS:units = "ppb" ;
CH4_UCATS:missing_value = NaNf ;
CH4_UCATS:operating_status = "Operating" ;
float CH4e_UCATS(Time) ;
CH4e_UCATS:long_name = "UCATS Methane Error" ;
CH4e_UCATS:units = "ppb" ;
CH4e_UCATS:missing_value = NaNf ;
CH4e_UCATS:operating_status = "Operating" ;
float CO_UCATS(Time) ;
CO_UCATS:long_name = "UCATS Carbon Monoxide" ;
CO_UCATS:units = "ppb" ;
CO_UCATS:missing_value = NaNf ;
CO_UCATS:operating_status = "Operating" ;
float COe_UCATS(Time) ;
COe_UCATS:long_name = "UCATS Carbon Monoxide Error" ;
COe_UCATS:units = "ppb" ;
COe_UCATS:missing_value = NaNf ;
COe_UCATS:operating_status = "Operating" ;

```

```
// global attributes:
```

```

:Contents = "In situ chemical species and GFS analysis fields interpolated to HIAPER flight track" ;
:Chemistry_Merge_Author = "Cameron R. Homeyer, Texas A&M University" ;
:GFS_Interpolation_Author = "Kenneth P. Bowman, Texas A&M University" ;
:HIAPER_Input_file = "/data/GV/rf01/start08_rf01_gv_v05.nc" ;
:Source = "NCAR Research Aviation Facility" ;

```

```
:Address = "P.O. Box 3000, Boulder, CO 80307-3000" ;
:Phone = "(303) 497-1030" ;
:Conventions = "NCAR-RAF/nimbus" ;
:ConventionsURL = "http://www.eol.ucar.edu/raf/Software/netCDF.html" ;
:ConventionsVersion = "1.3" ;
:ProcessorRevision = "4227" ;
:ProcessorURL = "http://svn/svn/raf/trunk/nimbus" ;
:DateProcessed = "2008-11-29 19:15:44 +0000" ;
:ProjectName = "START08" ;
:Aircraft = "N677F" ;
:ProjectNumber = "START08" ;
:FlightNumber = "rf01" ;
:FlightDate = "04/18/2008" ;
:InterpolationMethod = "Linear" ;
:coordinates = "LONC LATC GGALT Time" ;
:wind_field = "WSC WDC WIC" ;
:landmarks = "39.9083 -105.116 BJC" ;
:TimeInterval = "14:58:00-22:04:00" ;
:Categories = "Position,Thermodynamic,Aircraft State,Atmos. State,Liquid Water,Uncorr\'d Raw,Wind,PMS
Probe,Housekeeping,Chemistry,Radiation,Non-Standard" ;
:DGPS_datamerged = "2008-12-12 JAG" ;
:History = "Thu Jul  2 13:10:42 2009: ncatted -a history,global,d,c, ./START08rf01.nc" ;
:Chemistry_Input_Files = "start08_rf01_RAF_CO_final_v01.txt, start08_rf01_NONOyO3_final_v03.GV,
start08_rf01_O3_NOAA_final_v03.txt, start08_rf01_H2O_UCATS_final_v01.txt, start08_rf01_CLH_final_v02.txt,
start08_rf01_sid2h_final_v01.nc, start08_rf01_mrtdl_raf_final_v01.txt, start08_rf01_O3_UCATS_final_v01.txt,
start08_rf01_ao2_final_v02.txt, start08_rf01_GC_UCATS_final_v01.txt" ;
}
```