Subject: read SCIAMACHY NO2 hdf files
Posted by Kostasc on Sun, 01 Oct 2006 09:55:46 GMT
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hello all, first of all i would like to tell u that i have no idea
about programming in idl. What i 'd like to ask is if it is possible to
get from a hdf file the NO2 values for particular longitudes and
latitudes, i need them so as to compare with ground based measurements.
In the site i downloaded the hdf files they give the following code.
Could please someone tell me how to export the values in an ASII file?

```
pro read_scia_no2

 ;------------------------------------------------------------ --------
; Read data from GOME HDF file between two times "date1" and "date2"
; and stores in structure "no2"
;
;"maxorbits"      maximum number of orbits in a file
;"maxpix"      maximum number of pixels in an orbit
;"nplevs"          number of pressure levels in TEMIS SCIA data
;
;     Folkert Boersma, KNMI, February 2004
 ;------------------------------------------------------------ --------

maxorbits = 20
maxpix    = 5000
nplev     = 35

file      = 'no2track20030417.hdf'

; Define structure for GOME data
no2 = { $
       norbits : 0, $
       npix      : intarr(maxorbits), $
 a_lev     : make_array(nplev,/float,value=-999),$
 b_lev     : make_array(nplev,/float,value=-999),$
 date      : make_array(maxorbits,maxpix,/string,value=-999), $
       time      : make_array(maxorbits,maxpix,/string,value=-999), $
 lon       : make_array(maxorbits,maxpix,/float,value=-999.9), $
       lat       : make_array(maxorbits,maxpix,/float,value=-999.9), $
       vcd       : make_array(maxorbits,maxpix,/float,value=-999.9), $
       sigvcd    : make_array(maxorbits,maxpix,/float,value=-999.9), $
 vcdtrop   : make_array(maxorbits,maxpix,/float,value=-999.9), $
       sigvcdt   : make_array(maxorbits,maxpix,/float,value=-999.9), $
 vcdstrat  : make_array(maxorbits,maxpix,/float,value=-999.9), $
       sigvcds   : make_array(maxorbits,maxpix,/float,value=-999.9), $
       fltrop    : make_array(maxorbits,maxpix,/int,value=-999), $
 psurf     : make_array(maxorbits,maxpix,/float,value=-999.9), $
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 sigvcdak  : make_array(maxorbits,maxpix,/float,value=-999.9), $
 sigvcdtak : make_array(maxorbits,maxpix,/float,value=-999.9), $
 kernel    : make_array(maxorbits,maxpix,nplev,/float,value=-999),$
 ghostcol  : make_array(maxorbits,maxpix,/float,value=-999.9), $
 sza       : make_array(maxorbits,maxpix,/float,value=-999.9),$
 vza       : make_array(maxorbits,maxpix,/float,value=-999.9),$
 raa       : make_array(maxorbits,maxpix,/float,value=-999.9),$
 ssc       : make_array(maxorbits,maxpix,/int,value=-999), $
 loncorn   : make_array(maxorbits,maxpix,4,/float,value=-999.),$
 latcorn   : make_array(maxorbits,maxpix,4,/float,value=-999.),$
       scd       : make_array(maxorbits,maxpix,/float,value=-999.),$
 amf       : make_array(maxorbits,maxpix,/float,value=-999.),$
 amftrop   : make_array(maxorbits,maxpix,/float,value=-999.),$
 amfgeo    : make_array(maxorbits,maxpix,/float,value=-999.),$
 scdstr    : make_array(maxorbits,maxpix,/float,value=-999.),$
 clfrac    : make_array(maxorbits,maxpix,/float,value=-999.),$
 cltpres   : make_array(maxorbits,maxpix,/float,value=-999.),$
 albclr    : make_array(maxorbits,maxpix,/float,value=-999.),$
 crfrac    : make_array(maxorbits,maxpix,/float,value=-999.),$
 ltropo    : make_array(maxorbits,maxpix,/int,value=-999)}


id = hdf_sd_start(file,/read)
; The HDF_SD_FILEINFO procedure retrieves the number of datasets and
; global attributes in an HDF file.
hdf_sd_fileinfo,id,datasets,attributes
help,datasets,attributes

iret = 0
for i=0,attributes-1 do begin
  hdf_sd_attrinfo,id,i,name = name, data = d
  command = name+'=d'
  iret = execute(command)
  print, 'Retrieved Attribute:',name,'  ',d
endfor
hdf_sd_end,id

; Open file and initialize vdata reading
file_id=hdf_open(file,/read)
vd_id = -1
vd_handle = -1
end_of_file=0

vds = hdf_vd_lone(file_id)
nvds = n_elements(vds)
if (nvds eq 0) then begin
    print, 'ERROR: No vdatas found in file'
    stop
```

```
endif

; Loop over vdatas
for i=0,attributes+nvds-1 do begin

    vd_id = hdf_vd_getid(file_id,vd_id)
    vd_handle=hdf_vd_attach(file_id,vd_id,/read)


 hdf_vd_get,vd_handle,nfields=nf,name=vd_name,count=count,fie lds=fields


    ; Read pressure fields a_lev and b_lev into variables
    if (strmid(vd_name,0,4) eq 'pres' ) then begin

       for j=0,nf-1 do begin
          hdf_vd_getinfo,vd_handle,j,name=fieldname,size=size,type=typ e

   name = strcompress(fieldname,/remove_all)
          iret = execute('nread=hdf_vd_read(vd_handle,'+$
                         name+',fields="'+fieldname+'")')
          if (iret ne 1) then begin
             print,'Error dataset',i
             stop
          endif

       endfor
       no2.a_lev(0:nplev-1)  = transpose(a_lev)
       no2.b_lev(0:nplev-1)  = transpose(b_lev)
    endif

    if (strmid(vd_name,0,4) eq 'NO2_' ) then begin
       if (vd_name ne 'start_time' and vd_name ne 'end_time') then
begin
   track_date = long64(strmid(vd_name,strlen(vd_name)-8,8))
   track_date = track_date * 1000 + 20000000000000
       endif

       ; Check whether orbit fits in data structure
       if (no2.norbits ge maxorbits) then begin
          print,no2.norbits
   print, 'ERROR: more orbits in file than', maxorbits
          stop
       endif
       if (count gt maxpix) then begin
          print, 'ERROR: orbit', no2.norbits+1,' has more pixels (', $
                 count, ' ) than', maxpix
          stop
```

```
      endif

      ; Read fields into variables
      for j=0,nf-1 do begin
         hdf_vd_getinfo,vd_handle,j,name=fieldname,size=size,type=typ e
        name = strcompress(fieldname,/remove_all)
        iret = execute('nread=hdf_vd_read(vd_handle,'+$
                    name+',fields="'+fieldname+'")')
        if (iret ne 1) then begin
          print,'Error dataset',i
          stop
        endif

      endfor

      ; Add variables to structure
      no2.date(no2.norbits,0:count-1)      = date
      no2.time(no2.norbits,0:count-1)      = time
      no2.lon(no2.norbits,0:count-1)       = lon
      no2.lat(no2.norbits,0:count-1)       = lat
      no2.vcd(no2.norbits,0:count-1)       = vcd
      no2.sigvcd(no2.norbits,0:count-1)    = sigvcd
      no2.vcdtrop(no2.norbits,0:count-1)   = vcdtrop
      no2.sigvcdt(no2.norbits,0:count-1)   = sigvcdt
      no2.vcdstrat(no2.norbits,0:count-1)  = vcdstrat
      no2.sigvcds(no2.norbits,0:count-1)   = sigvcds
      no2.fltrop(no2.norbits,0:count-1)    = fltrop
      no2.psurf(no2.norbits,0:count-1)     = psurf
      no2.sigvcdak(no2.norbits,0:count-1)  = sigvcdak
      no2.sigvcdtak(no2.norbits,0:count-1) = sigvcdtak
      no2.kernel(no2.norbits,0:count-1,*)  = transpose(kernel)
      no2.ghostcol(no2.norbits,0:count-1)  = ghostcol
      no2.npix(no2.norbits)                = count


   endif

   if (strmid(vd_name,0,4) eq 'GEO_') then begin

        ; Check whether orbit fits in data structure
        if (no2.norbits ge maxorbits) then begin
           print, 'ERROR: more orbits in file than', maxorbits
           stop
        endif
        if (count gt maxpix) then begin
           print, 'ERROR: orbit', no2.norbits+1,' has more pixels
('', $
             count, ' ) than', maxpix
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            stop
          endif

    ; Read fields into variables
          for j=0,nf-1 do begin

 hdf_vd_getinfo,vd_handle,j,name=fieldname,size=size,type=typ e
            name = strcompress(fieldname,/remove_all)
            iret = execute('nread=hdf_vd_read(vd_handle,'+$
                        name+',fields="'+fieldname+'")')
            if (iret ne 1) then begin
              print,'Error dataset',i
              stop
            endif
           endfor

           ; Add variables to structure
           no2.sza(no2.norbits,0:count-1)       = sza
           no2.vza(no2.norbits,0:count-1)       = vza
           no2.raa(no2.norbits,0:count-1)       = raa
           no2.ssc(no2.norbits,0:count-1)       = ssc
           no2.loncorn(no2.norbits,0:count-1,*) = transpose(loncorn)
           no2.latcorn(no2.norbits,0:count-1,*) = transpose(latcorn)


    endif

    if (strmid(vd_name,0,4) eq 'ANC_') then begin

          ; Check whether orbit fits in data structure
          if (no2.norbits ge maxorbits) then begin
             print, 'ERROR: more orbits in file than', maxorbits
             stop
          endif
          if (count gt maxpix) then begin
             print, 'ERROR: orbit', no2.norbits+1,' has more pixels
('', $
               count, ' ) than', maxpix
             stop
          endif

    ; Read fields into variables
          for j=0,nf-1 do begin

 hdf_vd_getinfo,vd_handle,j,name=fieldname,size=size,type=typ e
            name = strcompress(fieldname,/remove_all)
            iret = execute('nread=hdf_vd_read(vd_handle,'+$
                        name+',fields="'+fieldname+'")')
```

```
          if (iret ne 1) then begin
            print,'Error dataset',i
            stop
          endif

        endfor

        ; Add variables to structure
        no2.scd(no2.norbits,0:count-1)       = scd
        no2.amf(no2.norbits,0:count-1)       = amf
        no2.amftrop(no2.norbits,0:count-1)   = amftrop
        no2.amfgeo(no2.norbits,0:count-1)    = amfgeo
        no2.scdstr(no2.norbits,0:count-1)    = scdstr
        no2.clfrac(no2.norbits,0:count-1)    = clfrac
        no2.cltpres(no2.norbits,0:count-1)   = cltpres
        no2.albclr(no2.norbits,0:count-1)    = albclr
        no2.crfrac(no2.norbits,0:count-1)    = crfrac
        no2.ltropo(no2.norbits,0:count-1)    = ltropo
    no2.norbits                      = no2.norbits+1


    endif

    hdf_vd_detach, vd_handle

endfor

hdf_close, file_id

end
```

Thanks in advance
