F90 read routine for DOMINO HDF4 data file

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The program discussed here reads a DOMINO HDF4 data file, constructed with the IDL (`convert_hdfeos_hdf.pro`) or F90 (main.exe to be compiled from the DOMINO_he5_hdf4_converter.tar package) conversion routines that convert HDF-EOS5 DOMINO files into the standard HDF4 format used b y www.temis.nl for GOME, SCIAMACHY, and GOME-2 NO_2 datafiles.

First download DOMINO_hdf4_reader.tar, and untar by typing

```
>tar -xvf DOMINO_hdf4_reader.tar.
```

Then to compile and run the fortran90 code successfully, users will need the HDF libraries. These can be obtained from http://hdf.ncsa.uiuc.edu/, then click HDF4 or DOWNLOADS. Once the libraries have been installed, the code can be compiled on a linux workstation by typing:

```
>make
```

This will produce an executable called readomino2.exe. The excutable can be run by typing:

```
>readomino2.exe
```

The program main.f90 expects a user-defined filename (the one specified in the code should be replaced by the user), and then processes all orbits stored in the no2trackyyyymmdd.hdf file. Upon reading, the data are stored in a structure called omiNO2Track. In the sample code we read in one day of data, and select only mostly-clear (omiNO2Track%cloudradfrac < 50, or omiNO2Track%fltrop = 0) pixels over the approximate region of the Netherlands, and subsequently print out some basic properties of these pixels. Users can print any other fields of the structure omiNO2Track, as specified at the end of subroutine OmiReadTrack in no2omiread.f90.

There are a few minor things to be aware of when using the code for reading in DOMINO data in the HDF4 format. Before 1 February 2006, the DOMINO system has been using a 35-layer definition in TM4 based on interpolated ECMWF meteorological fields. Therefore, in no2omiread.f90, the fixed parameter called nr_pressures has been set to a value of 35. For datafiles with a date past the date of 1 February 2006, the number of layers has been changed (from 35 to 34) due to the ECMWF transition to a 91-layer grid, that was optimally interpolated to 34 layers for application to TM4 (also see Product Specification Document). This change can be easily addressed by replacing the nr_pressures with the value 34 when using DOMINO data for days later than 1 February 2006.