

```

clc

clear

close all

import matlab.io.hdf4.*

% Opening the HDF4 File.

FILE_NAME = 'CAL_LID_L2_VFM-Standard-V4-20.2015-01-02T19-51-53ZN_Subset.hdf';

SD_id = sd.start(FILE_NAME, 'rdonly');

% Reading data.

datafield_name='Feature_Classification_Flags';

sds_index1 = sd.nameToIndex(SD_id, datafield_name);

sds_id1 = sd.select(SD_id, sds_index1);

data = sd.readData(sds_id1);

sd.endAccess(sds_id1);

% Reading lat.

lat_name='Latitude';

sds_index2 = sd.nameToIndex(SD_id, lat_name);

sds_id2 = sd.select(SD_id, sds_index2);

lat = sd.readData(sds_id2);

sd.endAccess(sds_id2);

% Closing the file.

sd.close(SD_id);

% Converting data to double type for plot.

data=double(data);

lat=double(lat);

data = data';

lat = lat';

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% Selecting the 1-3 bits for Feature Type data.

% Keeping the original for sub-type.

data_ft = bitand(data, 7);

% Subsetting latitude values for the region of interest (approx. 21.5N to 30N).

lat = lat(12:200);

dim = size(lat, 1);

data2d = squeeze(data_ft(12:200, 1166:5515)); % -0.5km to 8.2km

data3d = reshape(data2d, dim, 290, 15);

data = squeeze(data3d(:, :, 1));

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% Generating altitude data according to file specification.

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% -0.5km to 8.2km

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altitude=[];

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for i=0:289

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    altitude(i+1) = -0.5 + i*0.03;

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end

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figure(1)

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contourf(lat, altitude, rot90(data, 1), 'linecolor', 'none');

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% Creating a custom color map for 8 different Feature Type key value.

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cmap=[           % Key      R   G   B

    [1.0000 1.0000 1.0000]; ... % 0=invalid   [255,255,255]

    [0.0000 0.0000 1.0000]; ... % 1=clear air [000,000,255]

    [0.2000 1.0000 1.0000]; ... % 2=cloud    [051,255,255]

    [1.0000 0.6000 0.0000]; ... % 3=aerosol  [255,153,000]

    [1.0000 1.0000 0.0000]; ... % 4=strato. feat[255,255,000]

    [0.0000 1.0000 0.0000]; ... % 5=surface  [000,255,000]

    [0.4980 0.4980 0.4980]; ... % 6=subsurface [127,127,127]

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[0.0000 0.0000 0.0000]; ... % 7=no signal [000,000,000]

];

colormap(cmap);

caxis([0 7]);

h=colorbar;

set(h,'Location','eastoutside','YTick',0:7,'YTickLabel',{'Invalid', 'Clear Air', 'Cloud',...

'Aerosol', 'Strato Feature', 'Surface', 'Subsurface', 'No Signal'},...

'FontName', 'Arial','FontSize',12,'FontWeight','bold') %setting the location and ticklevels for
colorbar

xlim([22 29])

ylim([-0.5 8])

xlabel('Latitude (degrees north)')

ylabel('Altitude (km)')

box on

set(gca,'Position',[0.05, 0.12, 0.75, 0.8],'FontName', 'Arial','FontSize',12,'FontWeight','bold','LineWidth',1.5)

```