**Visualising Sentinel-1 data**

1. Sentinel-1 has different polarisation options - remember that "VV" means vertically polarised signal transmitted out and vertically polarised signal received, whereas VH refers to vertically polarised signal transmitted out, and horizontally polarised signal is received.
2. First up we need to filter the Sentinel-1 image collection (COPERNICUS/S1\_GRD), using the script below. Be sure to use the geometry tool to create a point geometry over your region of interest ( I had use the Dehradun, UK, India region as an example) and rename it "roi".

Code :

var collectionVV = ee.ImageCollection('COPERNICUS/S1\_GRD')

.filter(ee.Filter.eq('instrumentMode', 'IW'))

.filter(ee.Filter.listContains('transmitterReceiverPolarisation', 'VV'))

.filter(ee.Filter.eq('orbitProperties\_pass', 'DESCENDING'))

.filterBounds(roi)

.select(['VV']);

print(collectionVV);

// Filter the collection for the VH product from the descending track

var collectionVH = ee.ImageCollection('COPERNICUS/S1\_GRD')

.filter(ee.Filter.eq('instrumentMode', 'IW'))

.filter(ee.Filter.listContains('transmitterReceiverPolarisation', 'VH'))

.filter(ee.Filter.eq('orbitProperties\_pass', 'DESCENDING'))

.filterBounds(roi)

.select(['VH']);

3.Centre the map view over your region of interest

Map.centerObject(roi, 13);

4. Use the median reducer to obtain the median pixel value across the all years for each pixel.

var VV = collectionVV.median();

5.Plot the median pixel values to the map view. Adjust the min and max visualisation parameters according to your chosen scene - us the inspectors to help you establish the value range.

// Adding the VV layer to the map

Map.addLayer(VV, {min: -14, max: -7}, 'VV');

6. Explore the image and examine which landscape features have high backscatter intensity (white), and which have low intensity (black).

7.Now derive the the VH median layer, and map it

//Calculate the VH layer and add it

var VH = collectionVH.median();

Map.addLayer(VH, {min: -20, max: -7}, 'VH');

8. Explore how VV and VH differ in their sensitivity to different land surfaces

9.Next we will experiment with making an RGB composite from the SAR data. To do this we need to create three layers that we can place into the Red, Green, and Blue channels.

// Create a 3 band stack by selecting from different periods (months)

var VV1 = ee.Image(collectionVV.filterDate('2018-01-01', '2018-04-30').median());

var VV2 = ee.Image(collectionVV.filterDate('2018-05-01', '2018-08-31').median());

var VV3 = ee.Image(collectionVV.filterDate('2018-09-01', '2018-12-31').median());

//Add to map

Map.addLayer(VV1.addBands(VV2).addBands(VV3), {min: -12, max: -7}, 'Season composite');



