

LAB 7 – Using SEVIRI for cloud microphysical studies

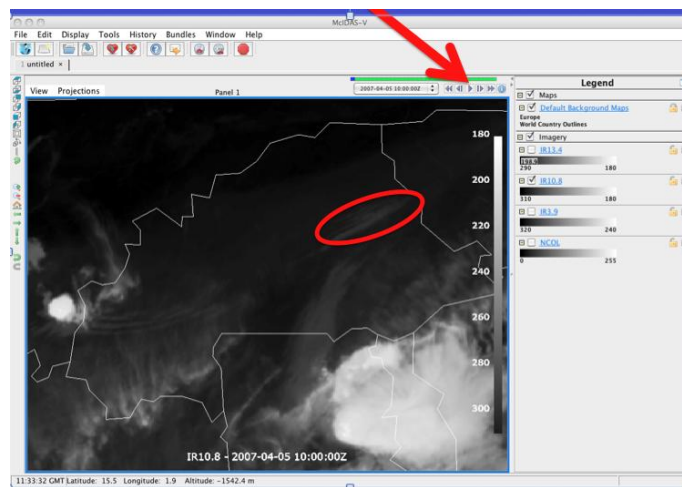
Case: Severe thunderstorm within polluted air over Ouagadougou, Burkina Faso (5 April 2007), documented earlier by HansPeter Roesli and Henk Verschuur, here:

http://oiswww.eumetsat.org/WEBOPS/iotm/iotm/20070405_ouaga/20070405_ouaga.html

Around 11:00 UTC on 5 April 2007 an isolated thunderstorm developed rapidly southwest of Ouagadougou, the capital of Burkina Faso.

Instructions for this lab (key questions are in **yellow**):

1. Open McIDAS-V
2. Read McIDAS-V bundle:
 - a. In the map window click **File** → **Open File**
 - b. Navigate to the file ‘**seviri_ouaga_thunderstorm.mcvz**’ in the folders **Data** → **Bundles**
 - c. Select the file and click **Open**
 - d. Click **OK** a few times, leaving the default options alone
 - e. If error message occurs, click **OK**
 - f. If **Select Input** window pops up for gamma value enter **1** and click **OK**
 - g. The system will now load in the data, which might take a while
 - h. McIDAS-V map window should now look like this (w/o red arrow and ellipse):



3. Click the **Play** button (see red arrow above) and watch deep convection evolve (where right ellipse is). You see the deep convection evolving between 10 UTC and 18 UTC in steps of 15 minutes. You are looking at the 11 micron brightness temperature observed SEVIRI.
4. Explore time series
 - a. Open the **Data Explorer** window, select **Field Selector**
 - b. Select **HRIT (All Bands)** under **Data Sources**
 - c. Under **Fields** select **10.8 um IR Surface/Cloud-top Temp**
 - d. Under **Displays**, select **Data Probe/Time Series**
 - e. Click **Create Display**
 - f. A colored dot will appear in the middle main display. At the same time, another display will open and show the time series associated with this point.
 - g. Move the colored dot around so that its location is over the center of the developing convective area.
 - h. How cold are the cloud tops in the development regions at 10:00?
 - i. How cold are they at 11:30?

5. Now create a simple formula to evaluate the ratio between 1.6 and 0.6 micron:
 - a. In the map window, click **Tools** → **Formulas** → **Create Formula**
 - b. In the window that shows up, create a description and a name for the formula, type in the formula $(100*a)/(100*b)$, then click **Add Formula**
 - c. Go back to the **Data Explorer** window, select the **Field Selector** tab
 - d. Select **Formulas** under **Data sources** → find your formula under **Fields** at the end of the list (below **SEVIRI Differences**)
 - e. Select your formula, then click **Create Display**
 - f. In the window that comes up, select the two fields to be divided. Select HRIT/1.6 um for the first field and HRIT/0.6 um for the second field. Click **OK**.
 - g. The data field now shows up in the map window. On the right-hand side of the main screen, right-click the corresponding color bar → **Change Range**, and select a range **0...100**.
 - h. Right-click the color bar again, select **System** → **Inverse Grey Scale**. This inverts the gray scale.
 - i. Which areas are bright now?
 - j. Which areas are dark?
 - k. When does the developing cloud start to glaciate?
 - l. Compare to IR signature. Which clouds show up, which clouds do not?