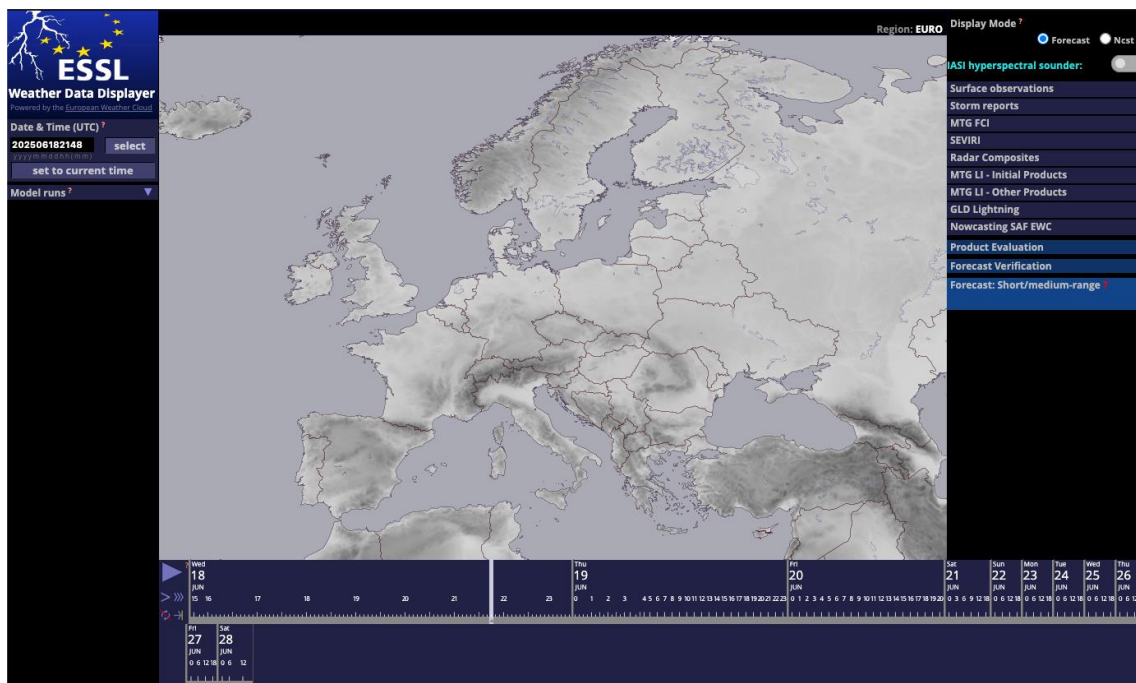


## LAB FCI RGB Applications: severe convective storms, Serbia, Romania, Bulgaria

Here are step-by-step instructions for this lab (key questions are in **yellow**):

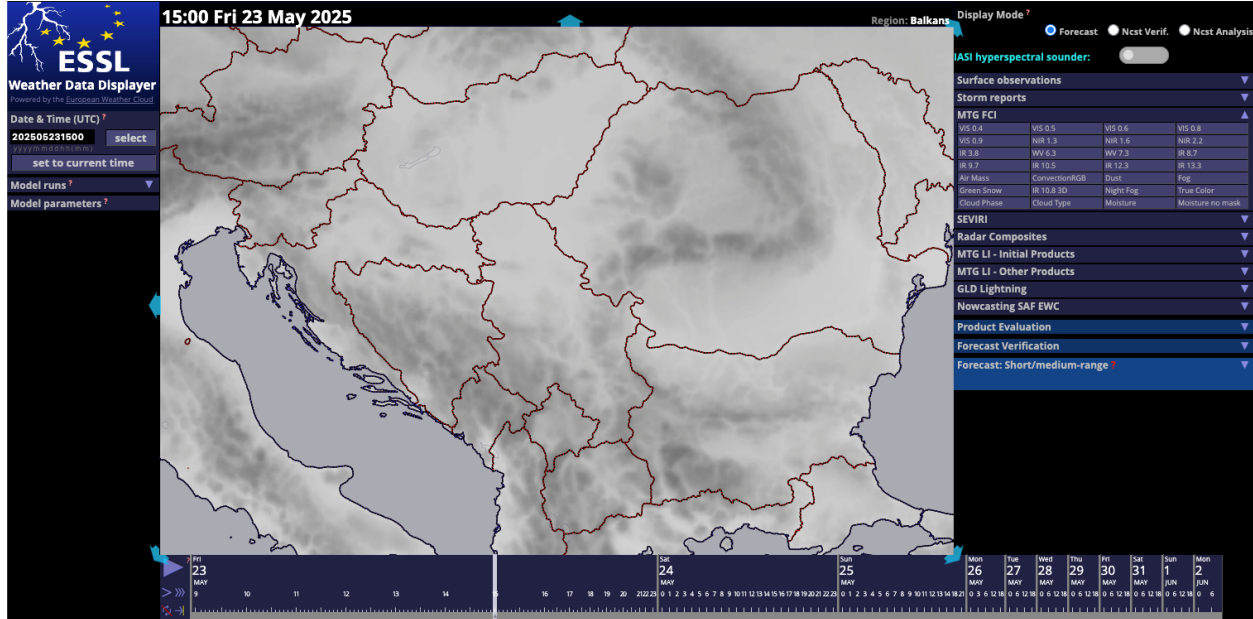
1. Open the Testbed Data Displaying tool and familiarize yourself with it.
  - a. Open <https://displayer.essl.org> . Log in to the Member State version using the username **eumjuly2025** and the password **2!Fn7b**
  - b. You should see a window such as in the image below:



- c. In the **upper left corner**, there is a Date&Time (UTC) field where you can put in the desired initialization time of the model.
  - d. At the bottom of the page, there is a timeslider tool, which is used to navigate all the data through time. Type in **“202505231500”**. This will move the time slider central position to **23 May 2025, 15 UTC**. This will load the model data of that initialization time and allow to show satellite imagery for the **previous 6 hours**.
2. Analyze synoptic situation for Europe and especially **Balkans**.
    - a. In the right-hand side menu please select **MTG FCI** section and product - **Total Moisture w/o mask**. Once the product displays, click on time-slider at the bottom of the page and move through time either by press and hold left or right arrow on your keyboard, by simply clicking with your mouse or by using left or right arrow key. Inspect the moisture field and conditions that prevail in the morning hours and early afternoon.
    - b. Compare the moisture observed by satellite with the model moisture. To do this, in the left-hand side menu click on **Model runs** (select a model, e.g. ECMWF) → **Instability and moisture** → **lapse r. & moisture / Tot. Prec. Water**. You can change the transparency of the upper (model) layer by using a slider on top next to the product name. **What can you say about the moisture field distribution? What can you say about it?** Is satellite-based moisture (Total Moisture w/o mask) aligned with the model one? Pay special attention to the area of Ukraine/Belarus or France. **Bonus question: Change the time to 08 UTC and go back in time to night-time hours. Why is there no Total Moisture w/o mask product available during nighttime?**
    - c. Now change the satellite image to **Dust RGB** (set time to **15 UTC**). The moist lower atmosphere in cloud free areas is shown usually in **deep blue color**, while dry atmosphere displays more pink. **How do the moisture conditions look in this composite? Is moisture information you get from this RGB composite aligned with other sources (ECMWF/FCI Total Moisture w/o mask)?**

Bonus question: **Change time to 05 UTC. Why does the Dust RGB turn increasingly blue when you change the time from 01 to 05 UTC?**

- Analyze the synoptic situation. **Are there any significant synoptic or mesoscale features that would be relevant for wide region of Southeastern Europe?**
- Zoom in on the Balkans by changing the **Region: EURO** to **Region: Balkans** in the drop-down menu just above the right-hand part of the image. The view should now be like in the below image:



### 3. CASE I – Storms in Northern Serbia.

- Please inspect all previously mentioned composites and product in this regional view. Additionally, have a look at **VIS0.6 (500 m) or Cloud Phase RGB** in MTG FCI during the morning and early afternoon hours. **What can you tell about the existing atmospheric motion and shear? What cloud feature stands out and relates to the mountain chains while also strongly suggesting wind speed in a deep layer (e.g. surface – 500 hPa)?**
- Change satellite product to **Cloud Phase RGB**. How many thunderstorm cores (cells) can you identify in the period **09-15Z**? What can you infer about these in terms of cloud particle phase and size?
- Which cell dominates the scene (Northern Serbia) in the period 12-14Z? What can you tell about its movement? What significant storm top features can be seen? Do they suggest something about the storm's strength? Change to **Cloud Type RGB** and try to identify cloud top features that show up in VIS0.6 or Cloud Phase RGB. Now change satellite image to SEVIRI → **Enh. IR** to further inspect the cloud top features. **Are there any significant features visible in this composite image? Are they aligned with what you can see in visible channels/composites?**
- Is there more than one core/updraft of this storm complex under the anvil?
- What is Above Anvil Cirrus Plume (AACP) and why does it show in the Cloud Phase RGB as a veil of very light blue-green color?

### 4. CASE II – Storms in Southeastern Romania/Northeastern Bulgaria.

- Go to 15-19Z** and shift attention to southeastern Romania/northeast Bulgaria. As the environment becomes favorable for initiation, the scene becomes quite crowded with numerous storms. **Which storms catch the eye in terms of their intensity, cloud top structure, and especially movement?**
- Please turn on SEVIRI → **Enh. IR** to inspect the cloud top features after the sun sets. **Are there any noticeable cloud top features that could indicate severity of the storms?**
- Turn on MTG LI → **Flash area (red)**. **What can you notice about flashes and their size relative to the storm's life cycle?**
- Go back in time to 15Z and analyze flash area size for storms in Northern Serbia.
- What is the general trend of flash area size as the storm matures and dies out?