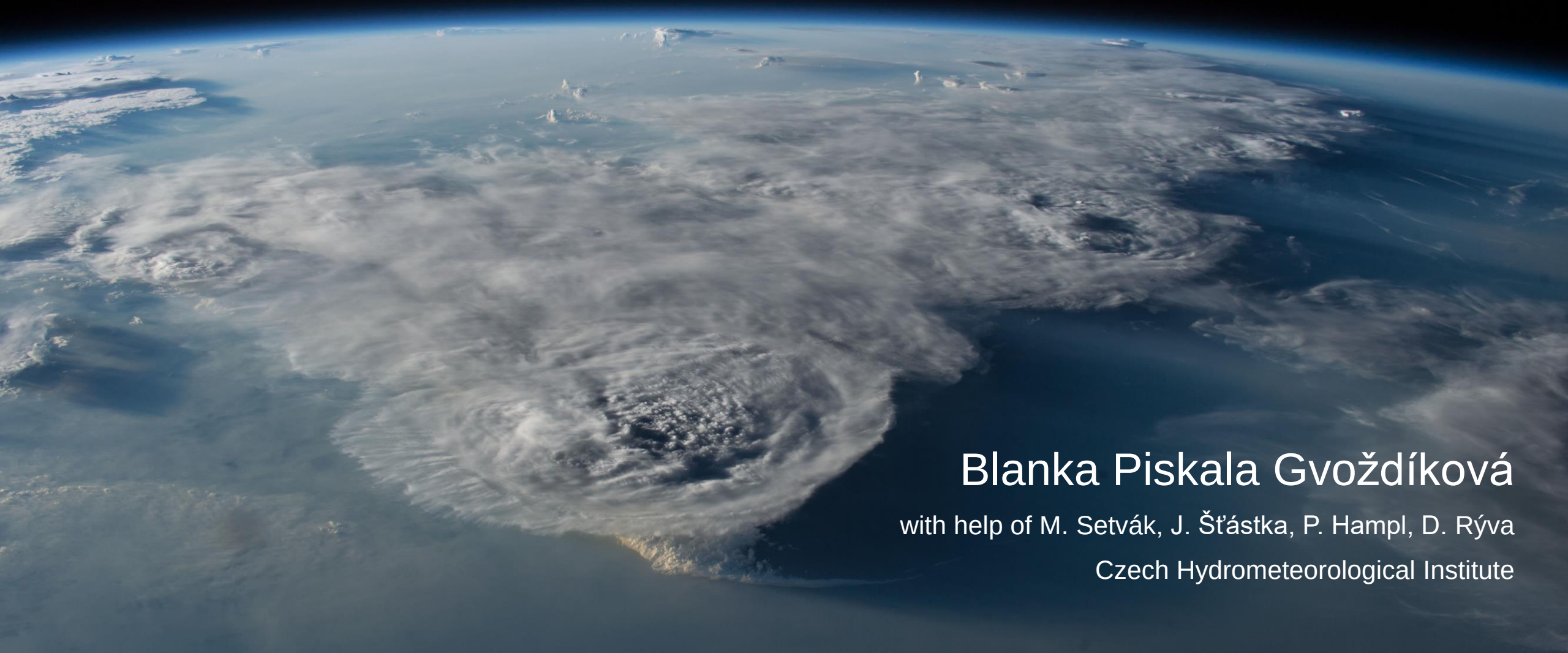


Stormchasing with Landsat and the future of MTG



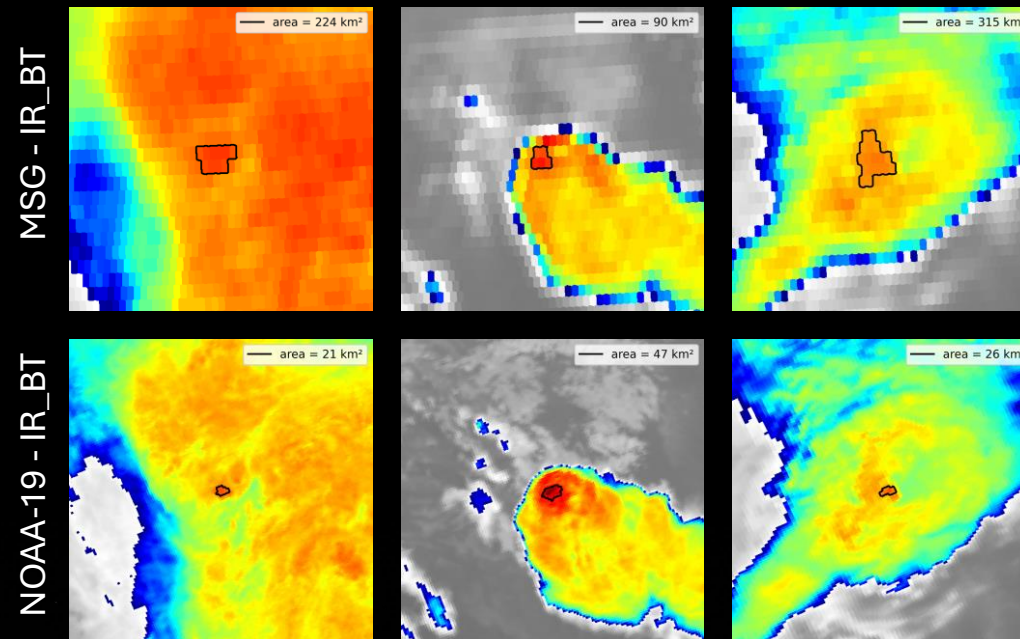
Blanka Piskala Gvoždíková

with help of M. Setvák, J. Šťástka, P. Hampl, D. Rýva

Czech Hydrometeorological Institute

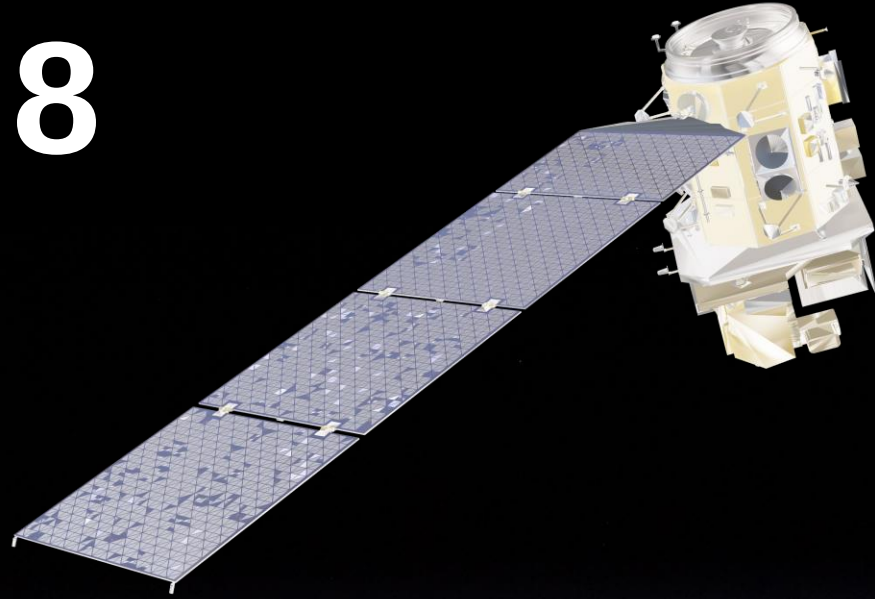
Motivation

- Highlight how the upcoming MTG resolution compares to other satellite capabilities in identifying overshooting tops



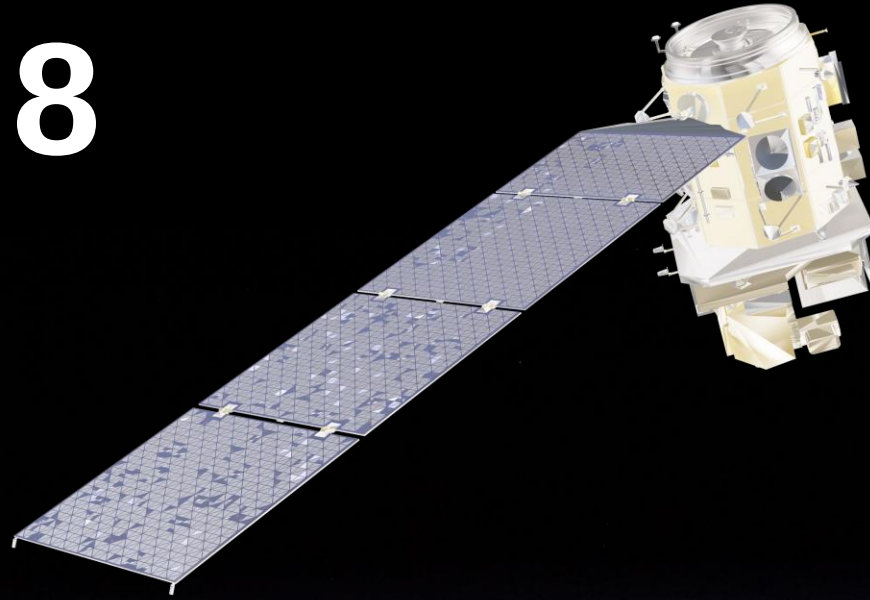
- Discussion on annotation strategies for dealing with detailed satellite data

Landsat 8



Landsat 8

Combination of visible, near-infrared (30 m resolution), and thermal bands (100 m resolution resampled to 30 m)



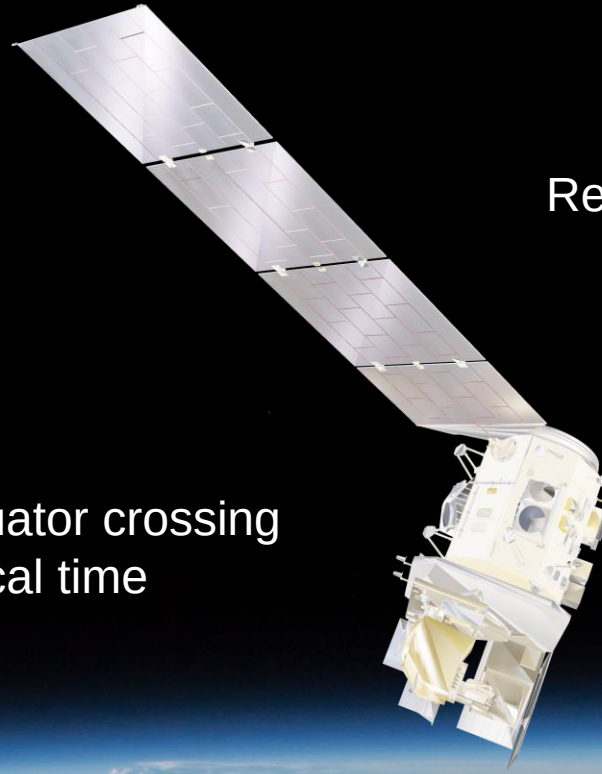
Problem of “banding” due to stray light, showing up across images collected by the Thermal Infrared Sensor (TIRS)



Landsat 8

Revisit time $\sim$ 16 days

The descending equator crossing
time at 10:00 AM local time



Storm searching mechanism



Algorithm to find satellite overpasses
around the event time



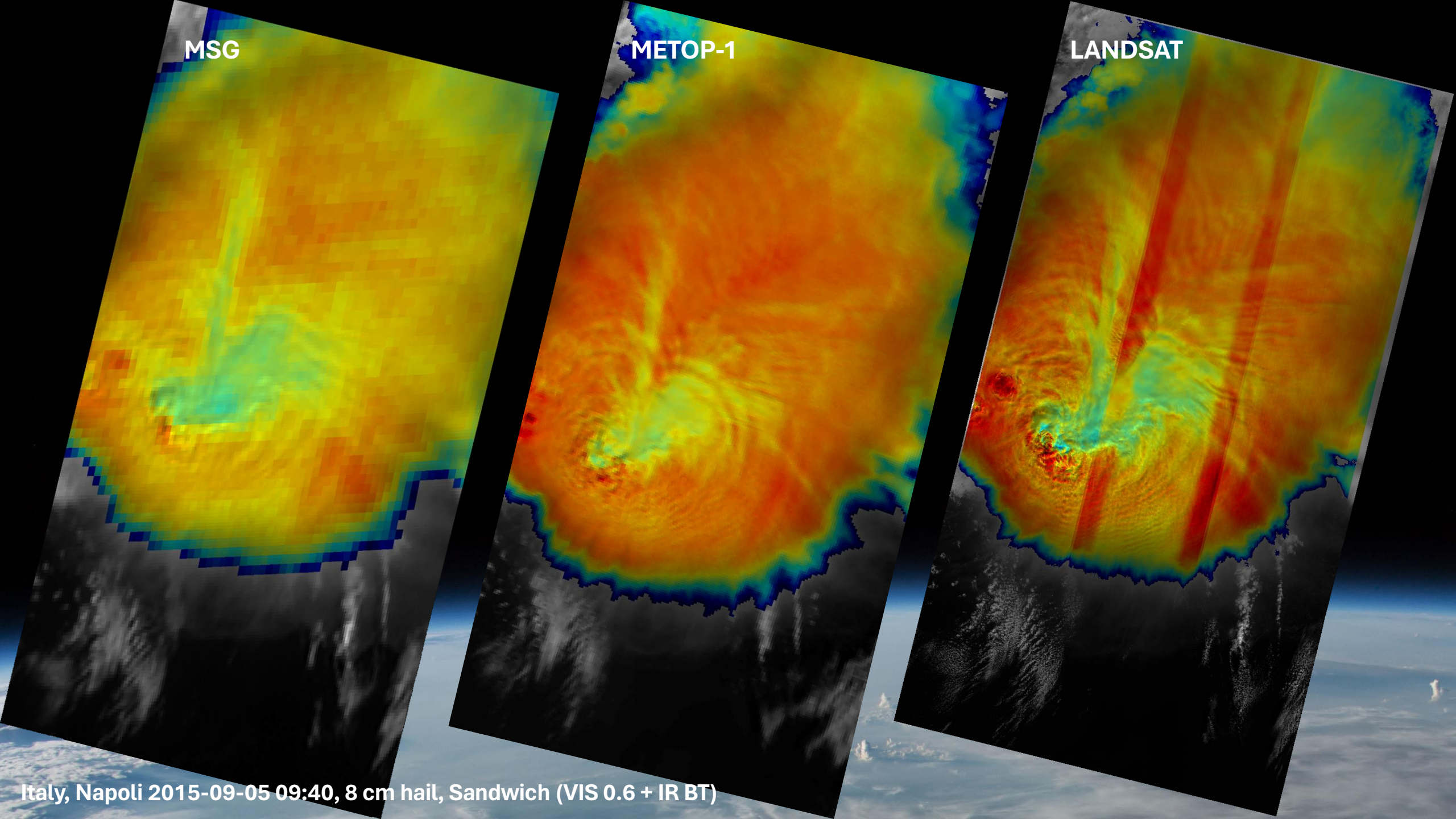
Hail events



MSG

METOP-1

LANDSAT

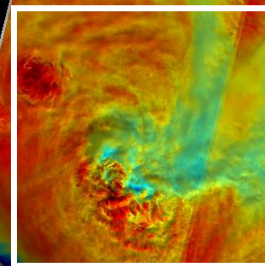
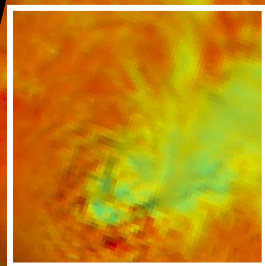
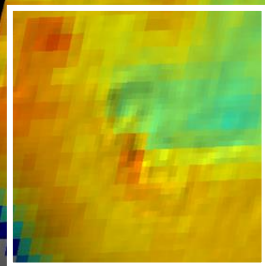


Italy, Napoli 2015-09-05 09:40, 8 cm hail, Sandwich (VIS 0.6 + IR BT)

MSG

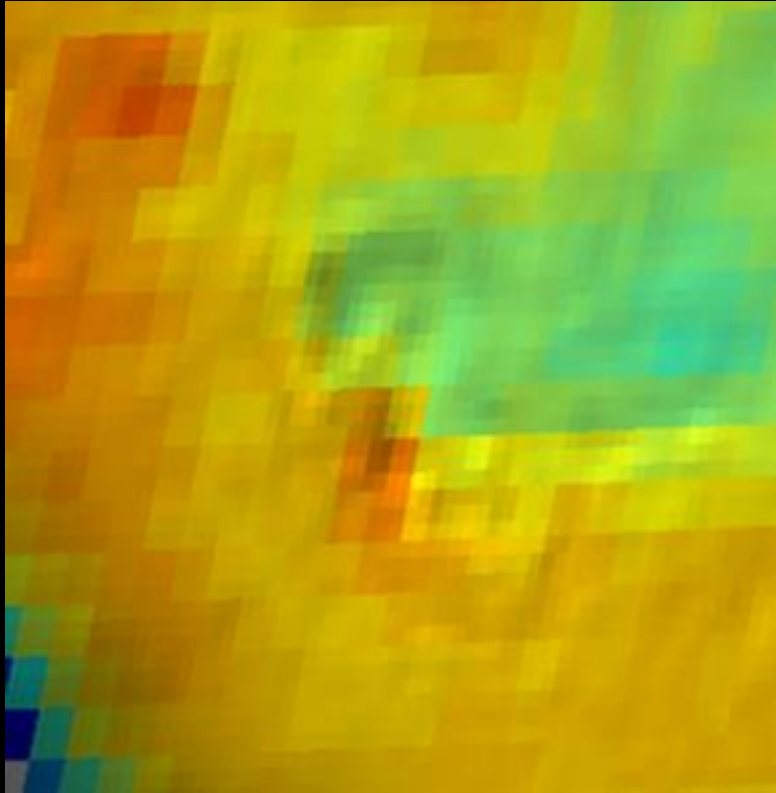
METOP-1

LANDSAT

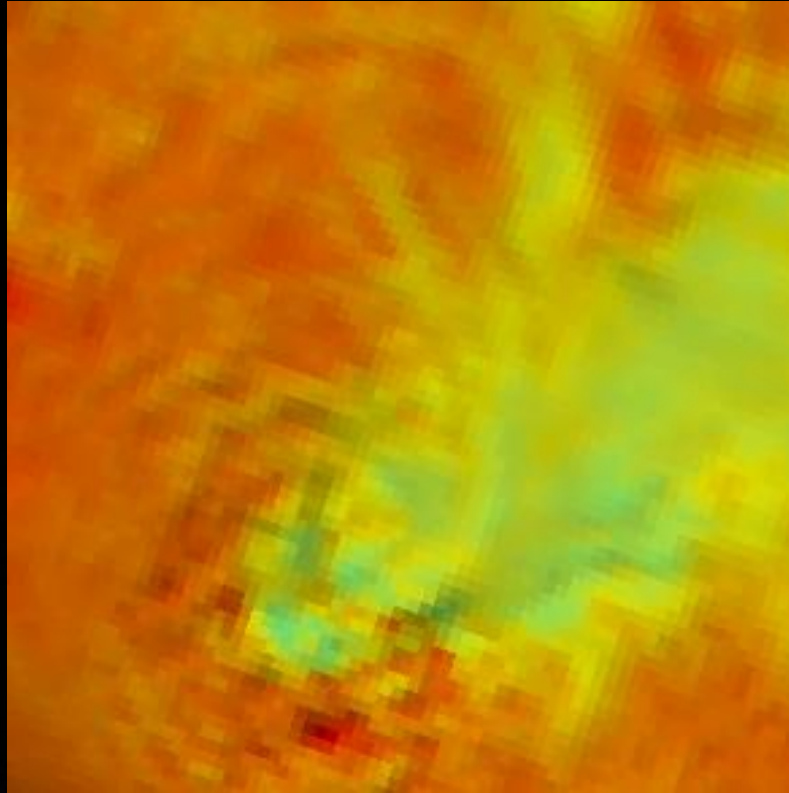


Italy, Napoli 2015-09-05 09:40, 8 cm hail, Sandwich (VIS 0.6 + IR BT)

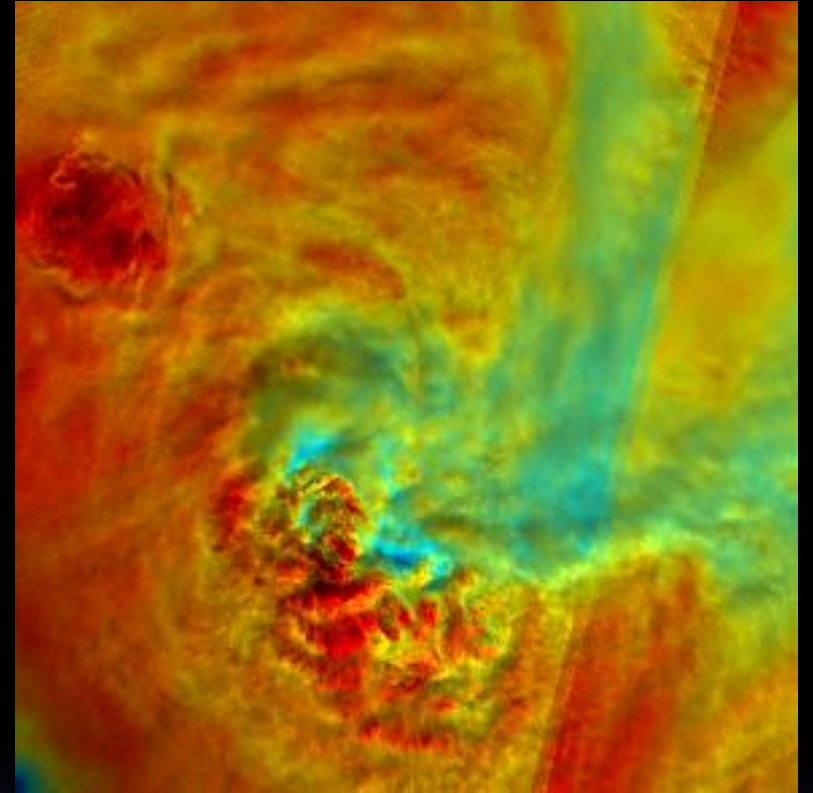
MSG



METOP-1



LANDSAT



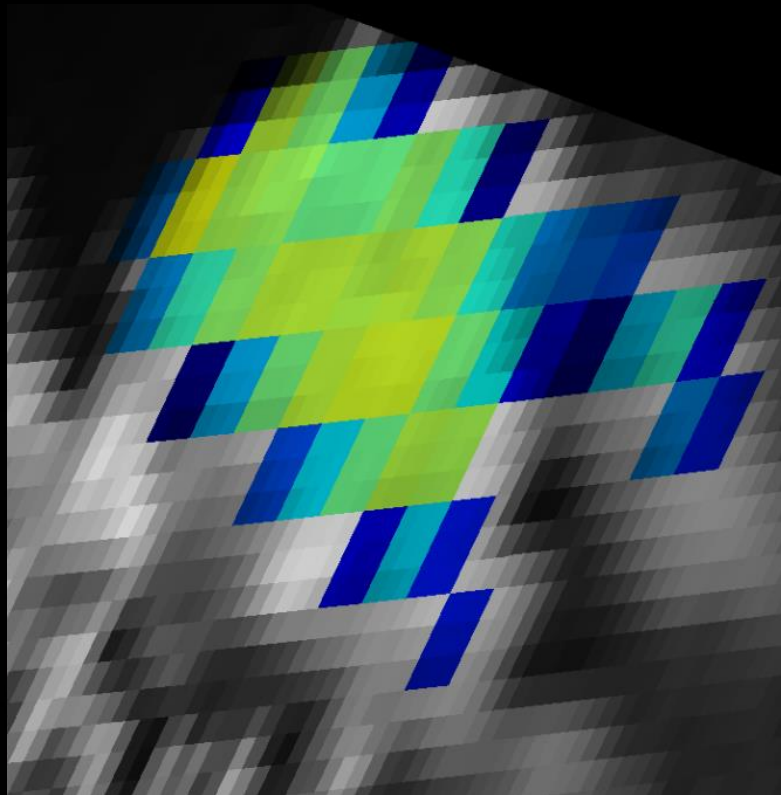
Italy, Napoli 2015-09-05 09:40, 8 cm hail, Sandwich (VIS 0.6 + IR BT)

...learn new czech word „kroupy“

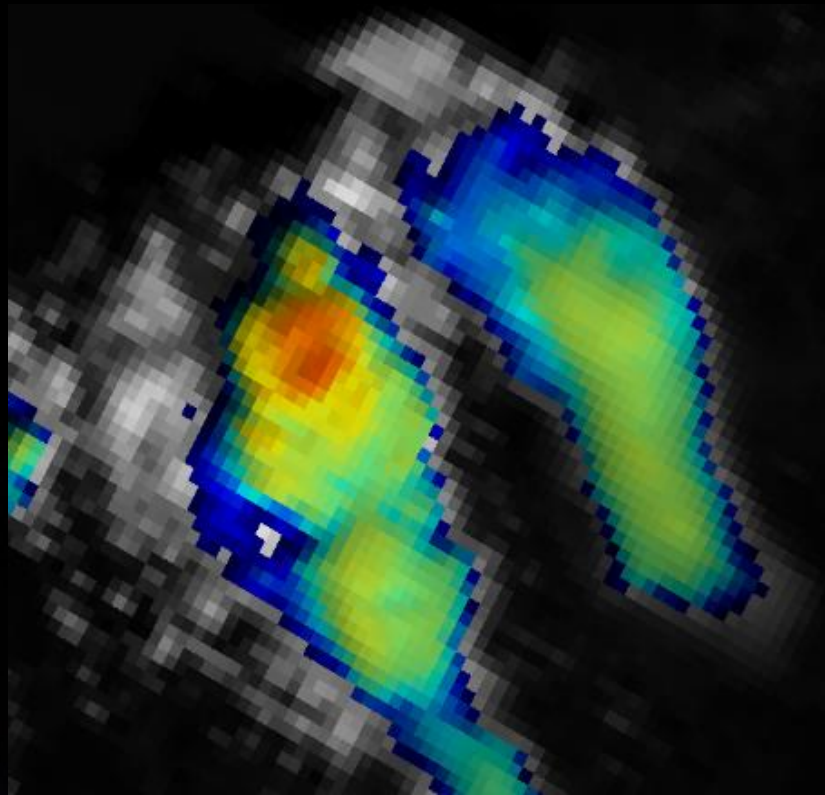


Italy, Napoli 2015-09-05

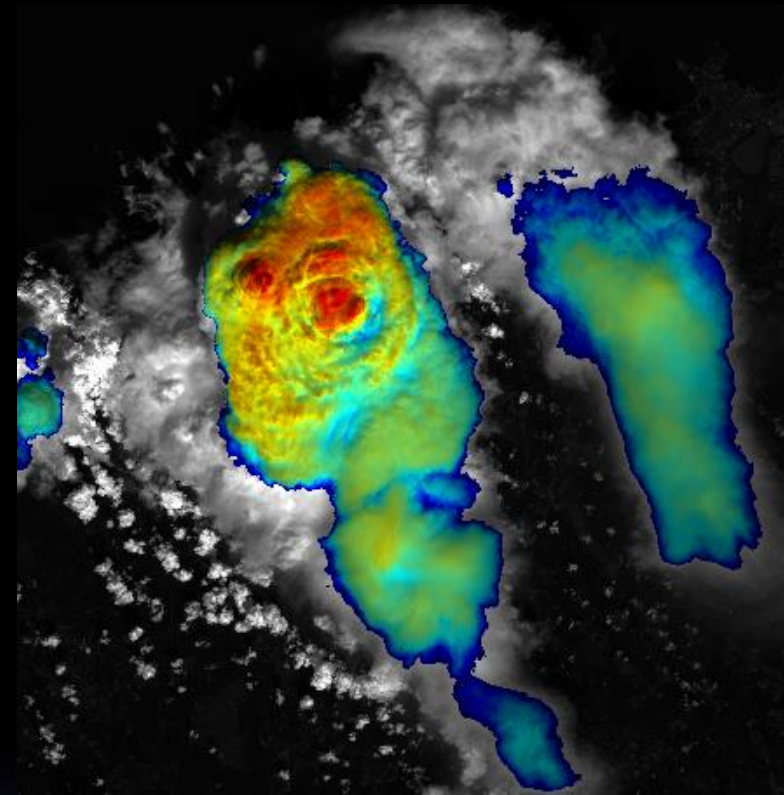
MSG



METOP-1



LANDSAT

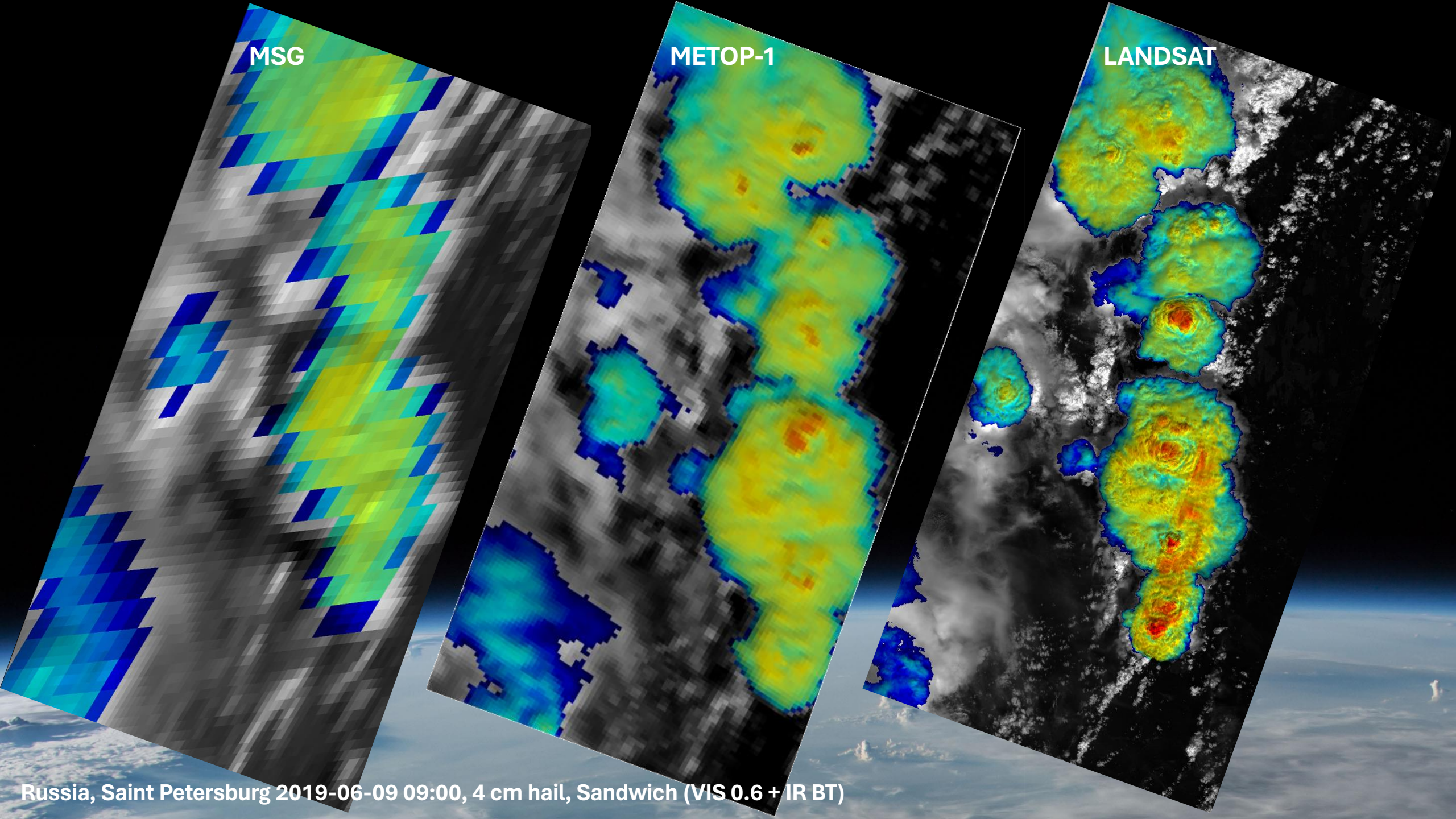


Estonia, Tallinn 2022-06-29 09:40, 2 cm hail, Sandwich (VIS 0.6 + IR BT)

MSG

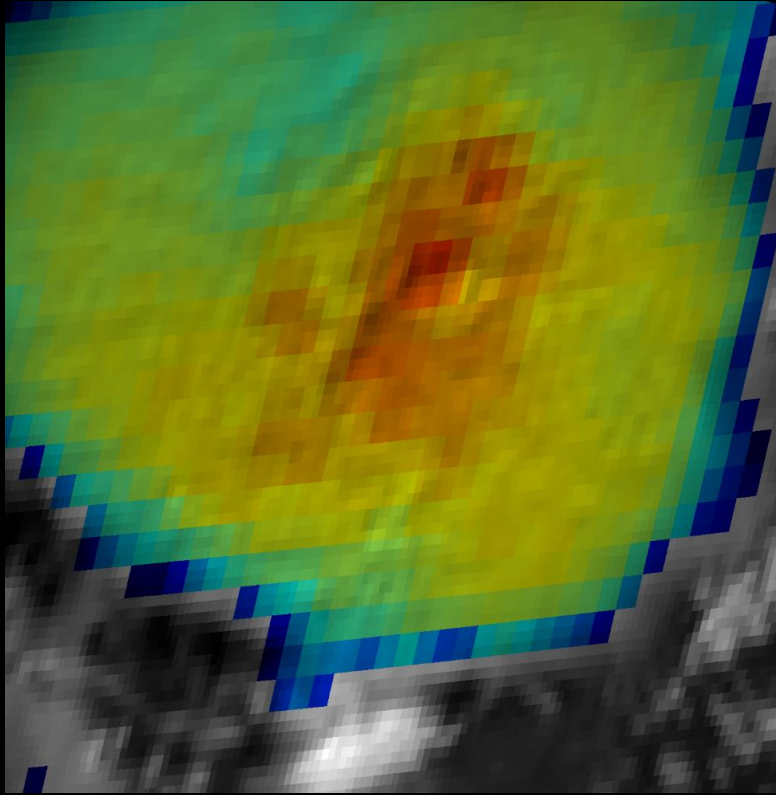
METOP-1

LANDSAT

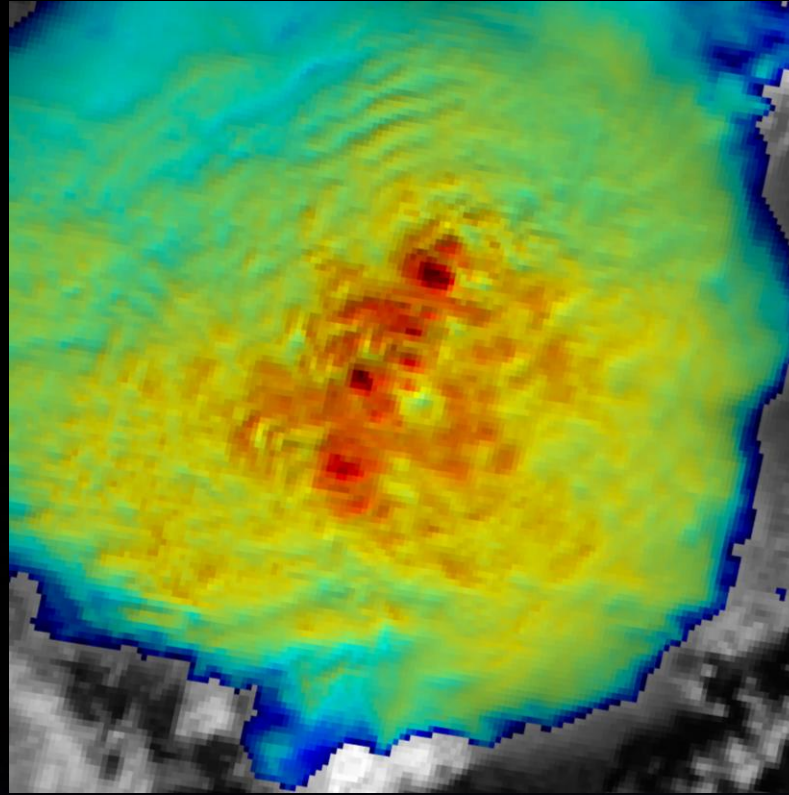


Russia, Saint Petersburg 2019-06-09 09:00, 4 cm hail, Sandwich (VIS 0.6 + IR BT)

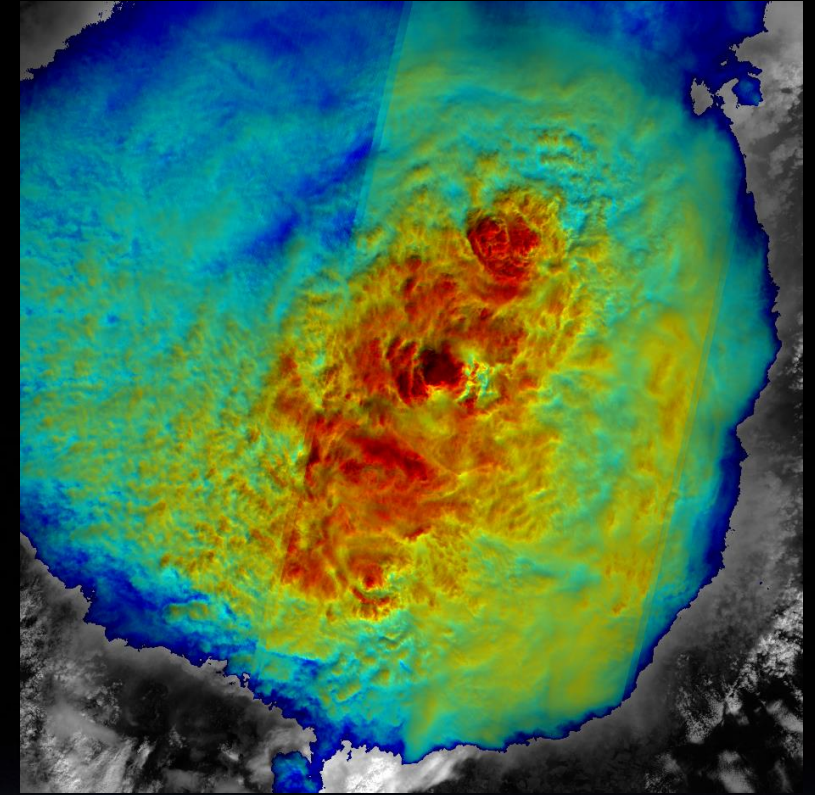
MSG



NOAA-18



LANDSAT



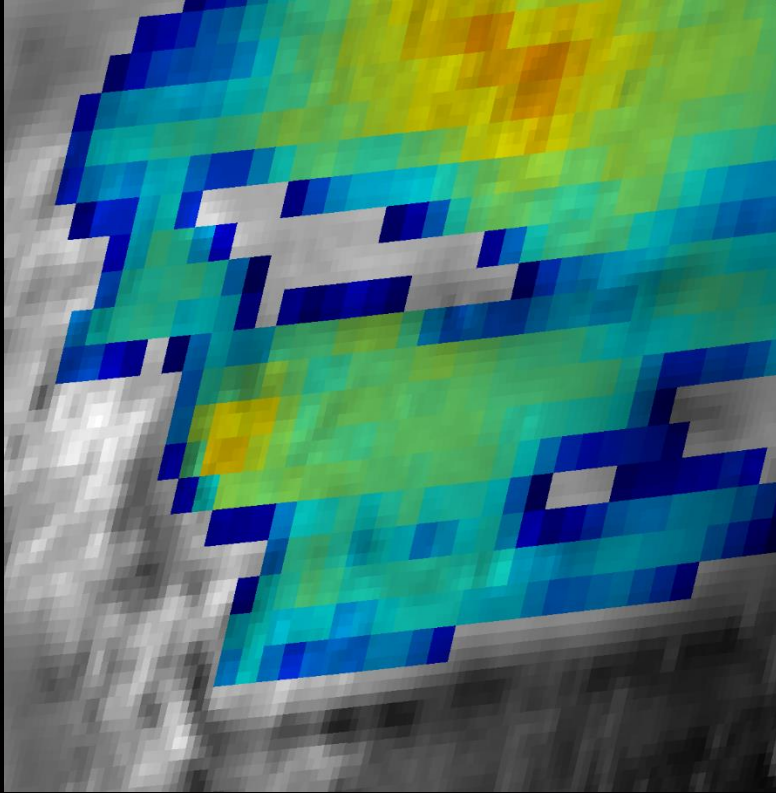
southeast Czechia, 2023-08-26 09:40, 3 cm hail, Sandwich (VIS 0.6 + IR BT)

CZRAD ZMAX

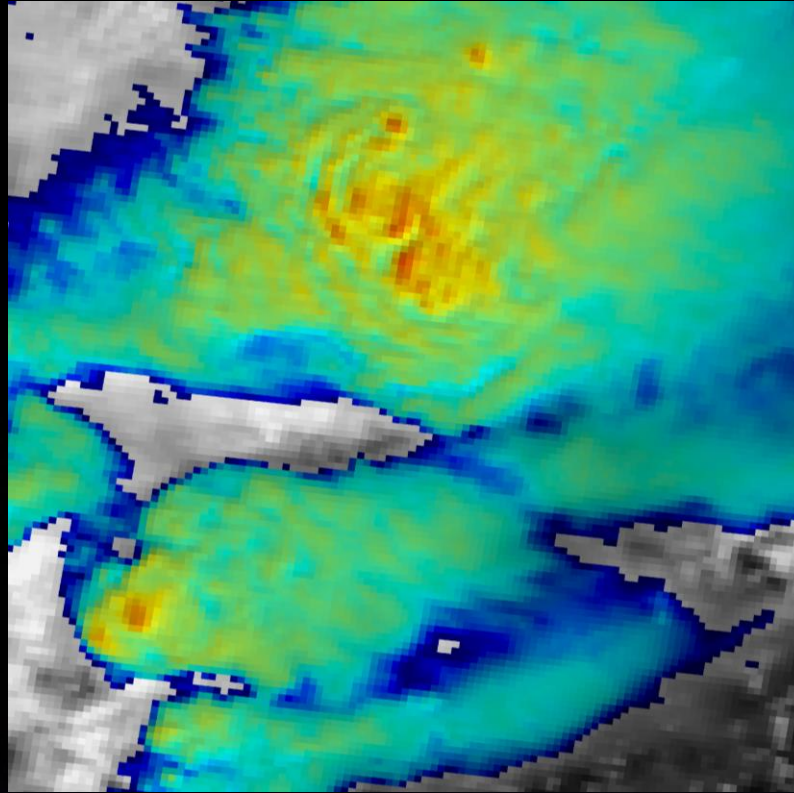
CZRAD ZDR
columns height

southeast Czechia, 2023-08-26 09:40, 3 cm hail, Sandwich (VIS 0.6 + IR BT)

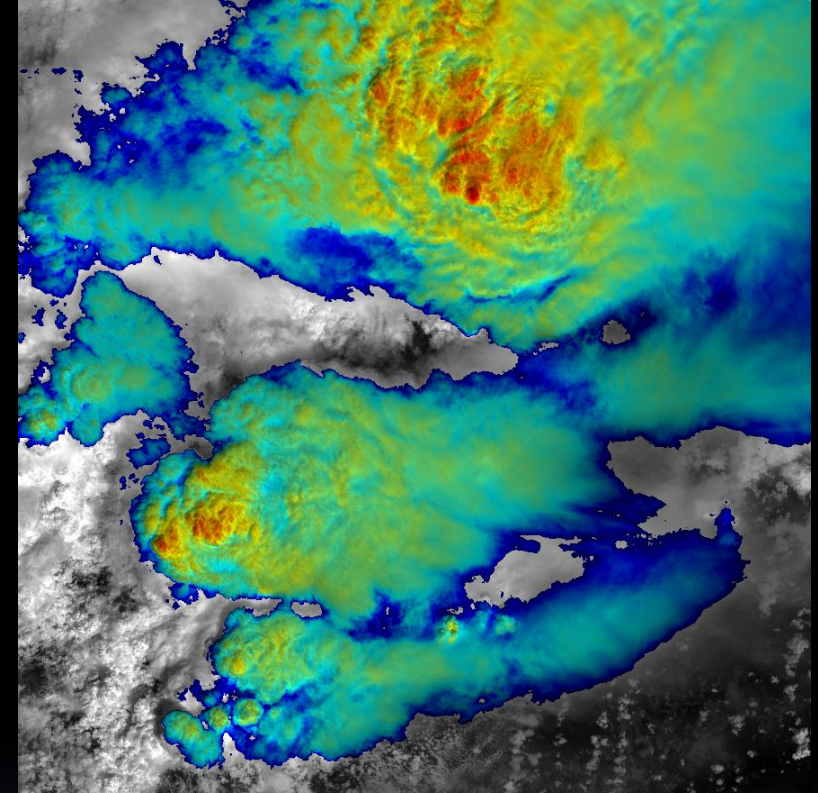
MSG



NOAA-18



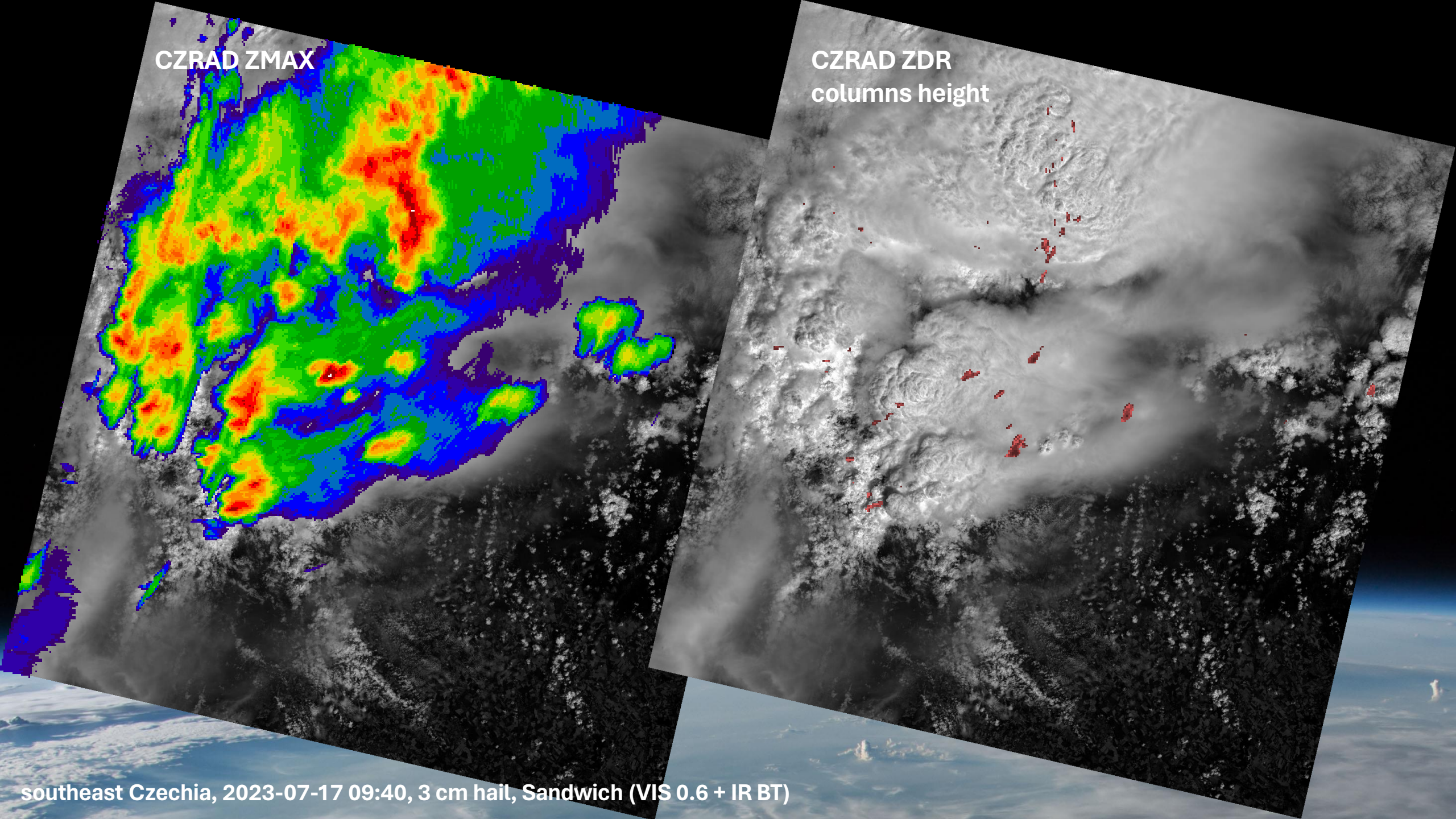
LANDSAT



southeast Czechia, 2023-07-17 09:40, 3 cm hail, Sandwich (VIS 0.6 + IR BT)

CZRAD ZMAX

CZRAD ZDR
columns height



southeast Czechia, 2023-07-17 09:40, 3 cm hail, Sandwich (VIS 0.6 + IR BT)

Takeaways & open questions

- Higher resolution can sometimes make images less clear
- Usually, a 1km thermal channel resolution is good enough to determine the size of overshooting tops
- What are the annotation strategies for dealing with detailed satellite data?
- How can radars help in detecting (size of) overshooting tops?



Thank you for attention!

