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VIIRS-based MTG FCI pixel size simulations

- convective storms (11 June 2018)
- fire detection (30 April / 01 May 2019)

EUMETSAT, MTG FCI MAG, Darmstadt, 12-13 June 2019

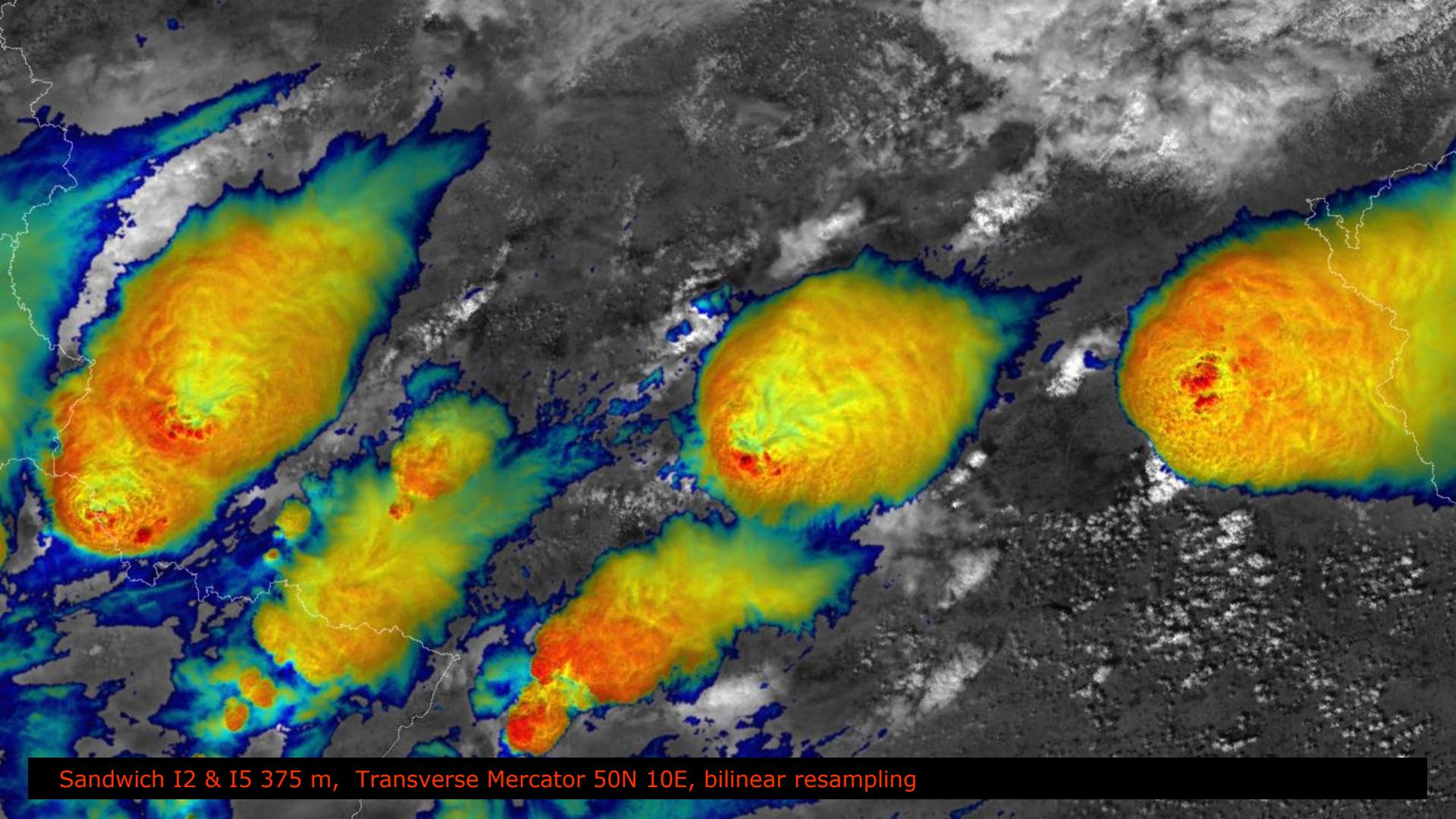
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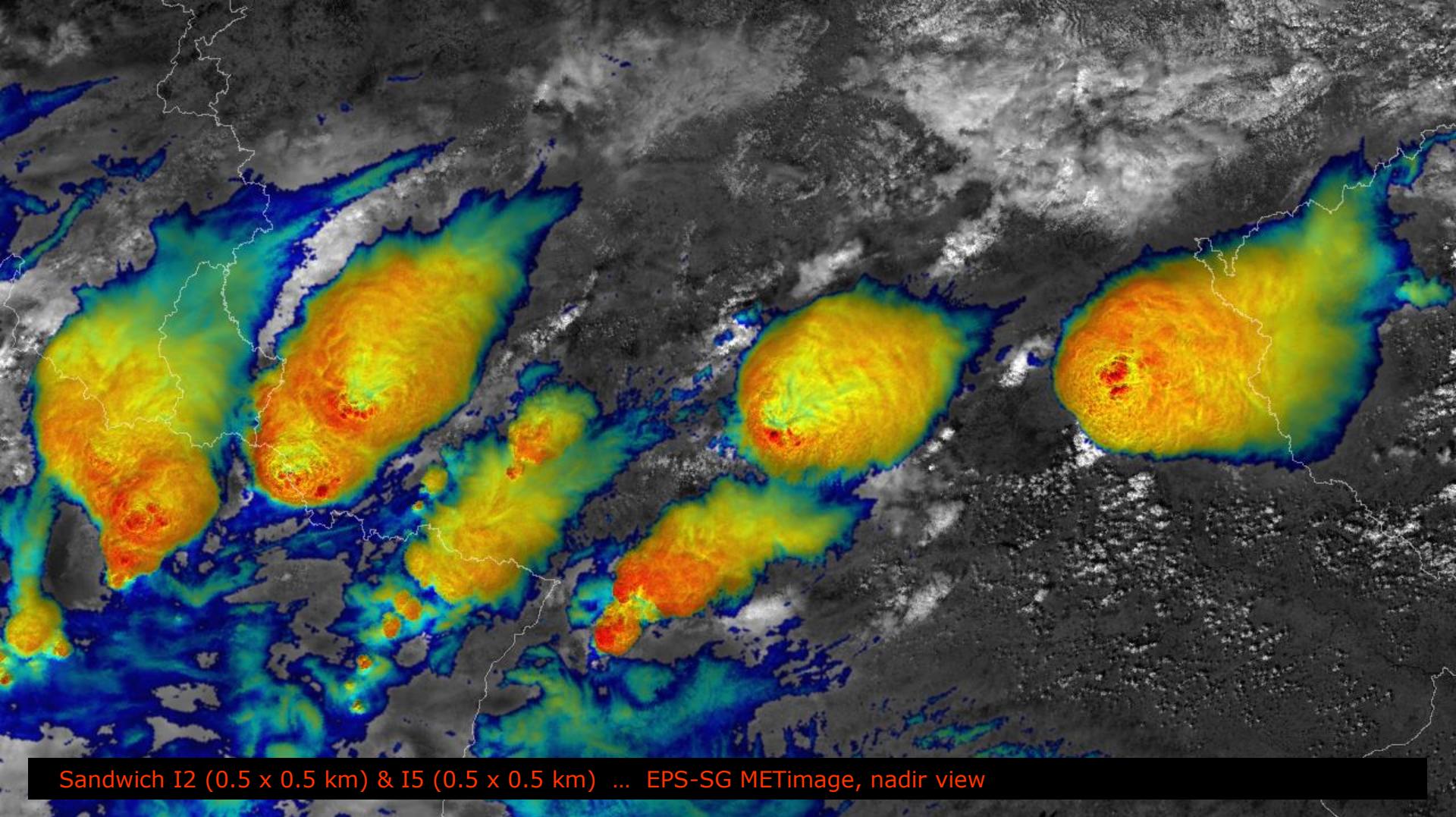
11 June 2018 – CONVECTIVE STORMS

Central Europe

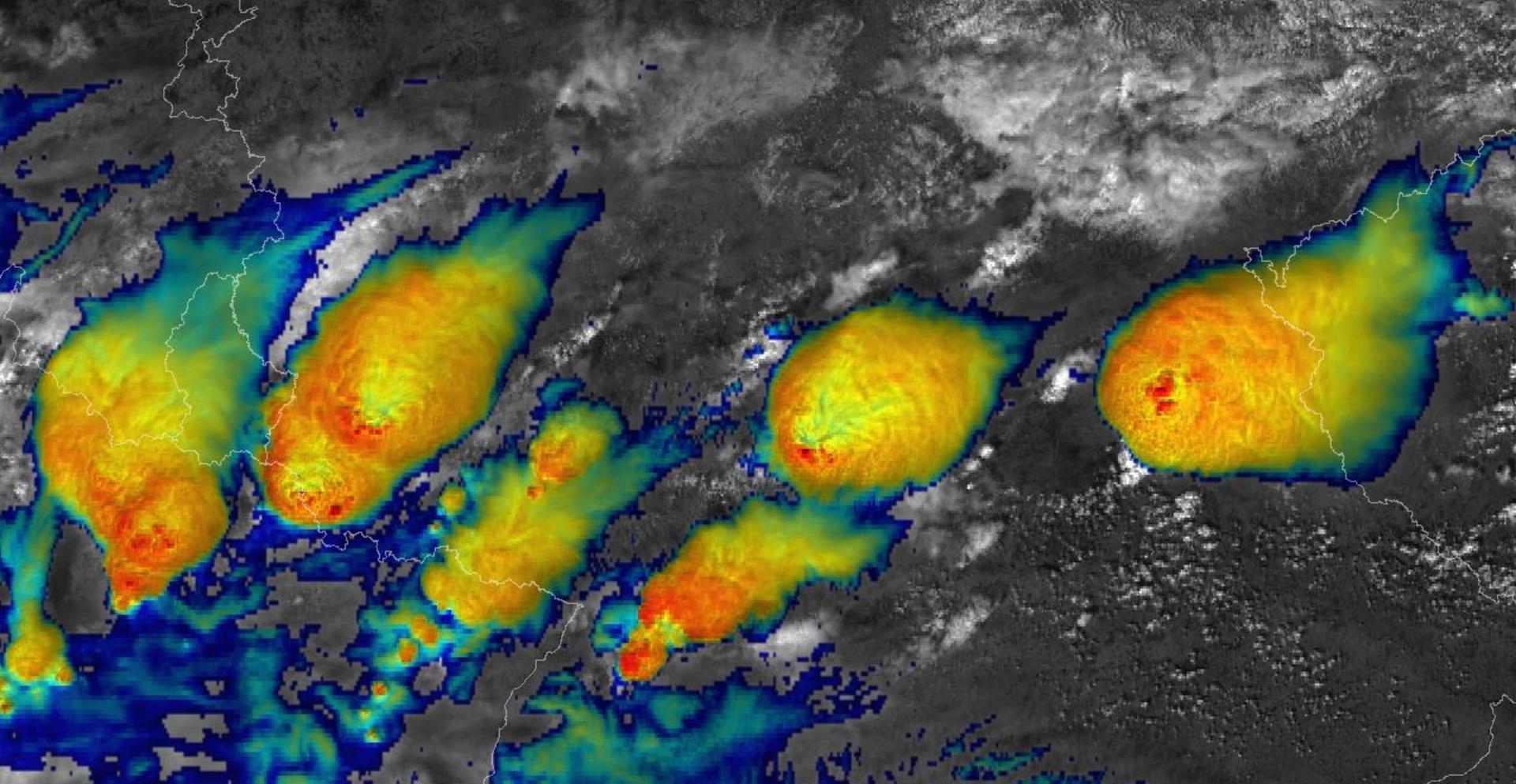
Source data: S-NPP, VIIRS bands I2 0.862 μm and I5 11.45 μm (375m, SDR), 11:37 UTC
processed in ENVI, using its [bilinear interpolation](#) and [pixel aggregate](#) resampling methods
simulations of MTG FCI VIS 0.6 (0.640 μm) 0.5 km HR / 1 km NR and IR10.5 (10.50 μm) 1 km HR / 2 km NR bands



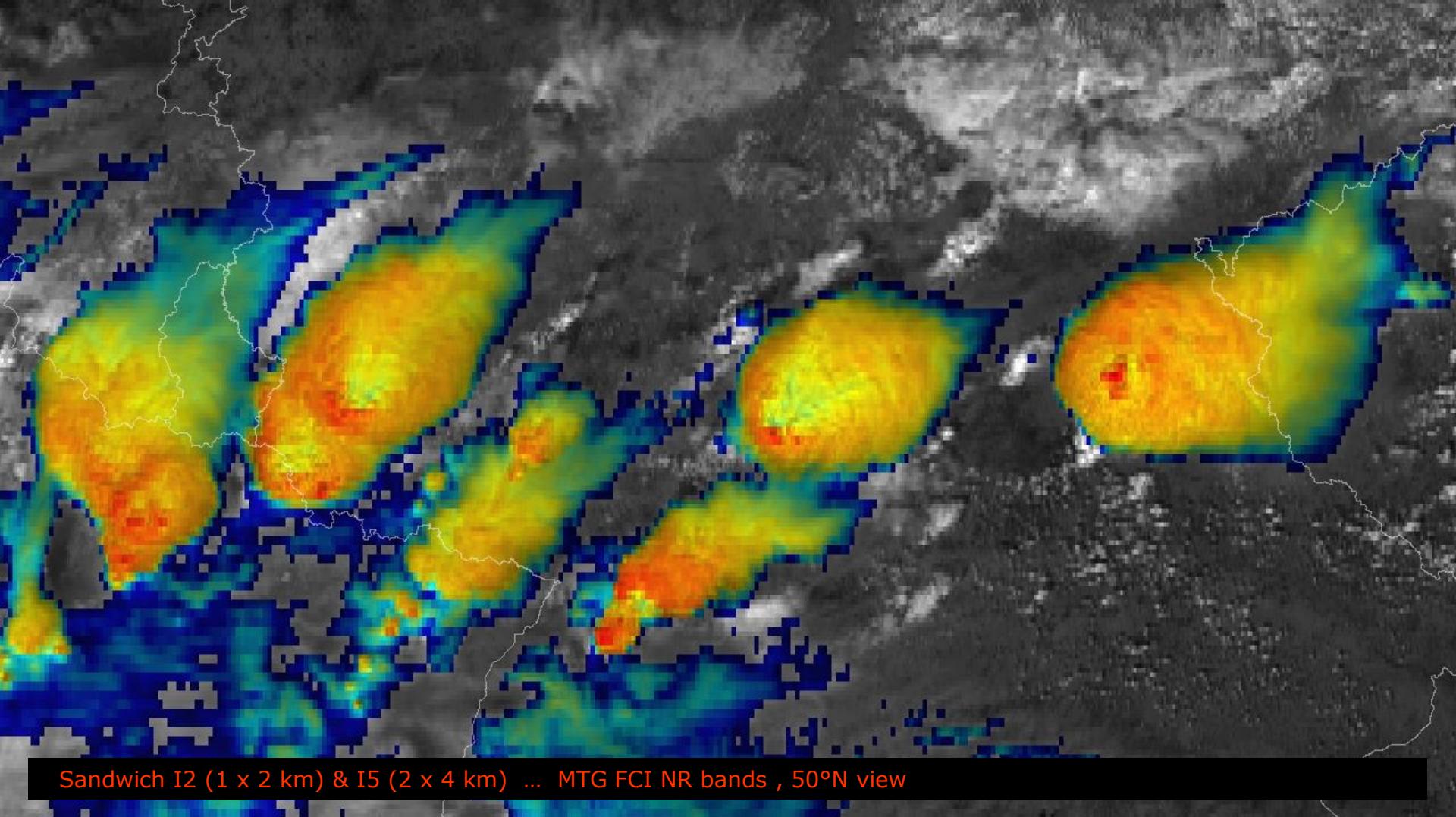
Sandwich I2 & I5 375 m, Transverse Mercator 50N 10E, bilinear resampling

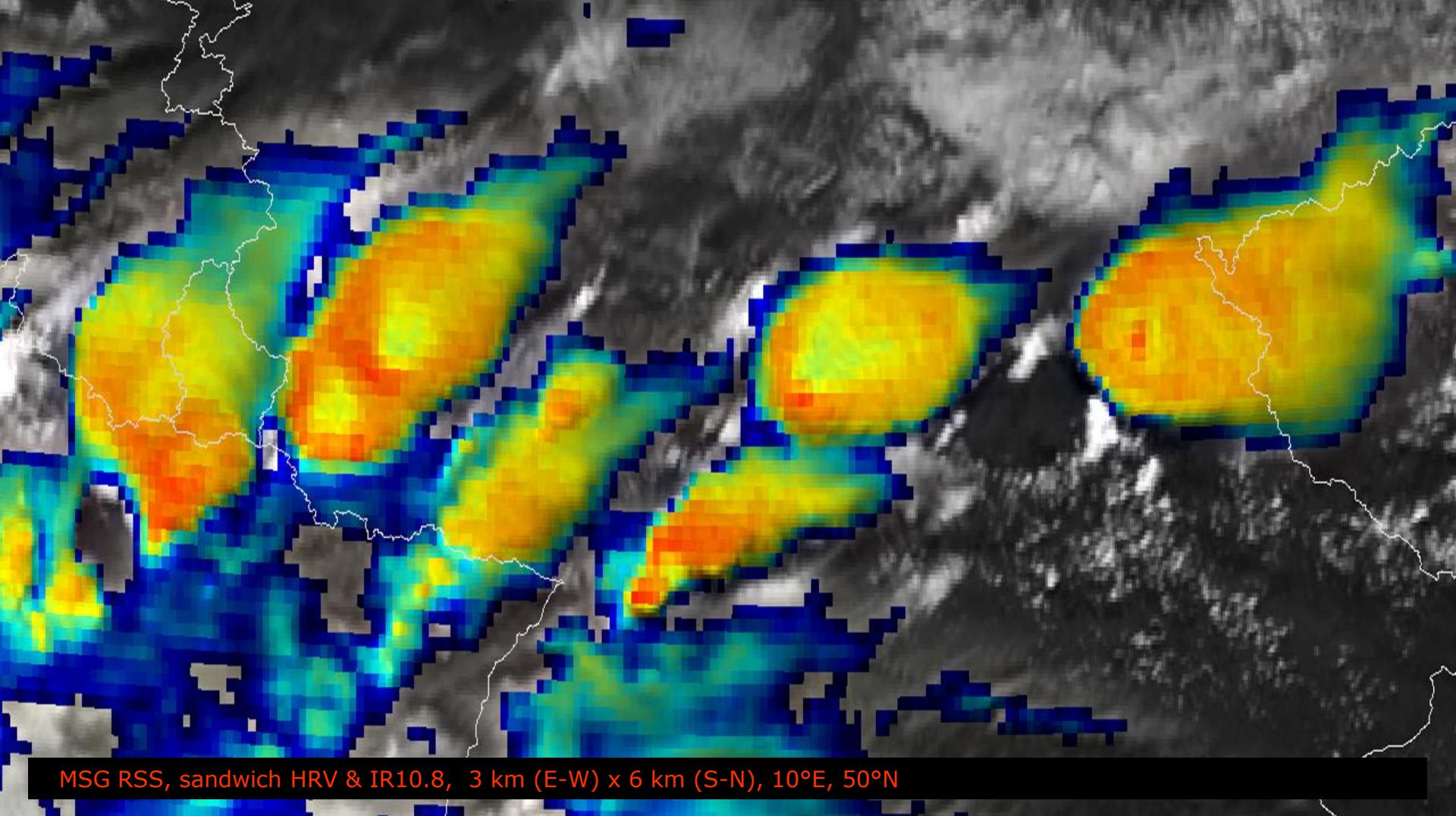


Sandwich I2 (0.5×0.5 km) & I5 (0.5×0.5 km) ... EPS-SG METimage, nadir view



Sandwich I2 (0.5 x 1 km) & I5 (1 x 2 km) ... MTG FCI HR bands, 50°N view



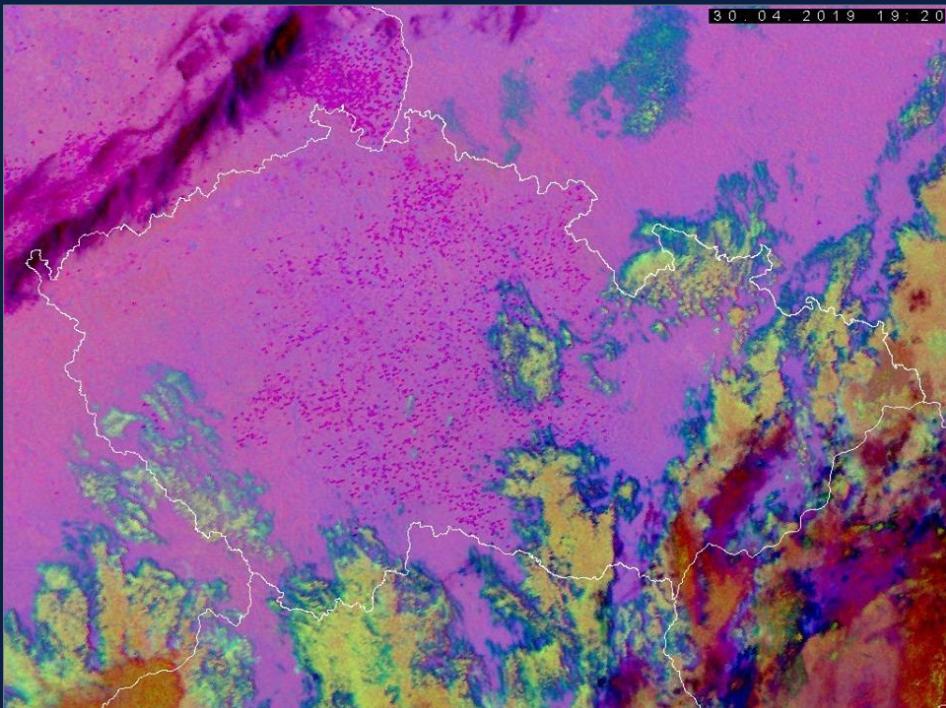
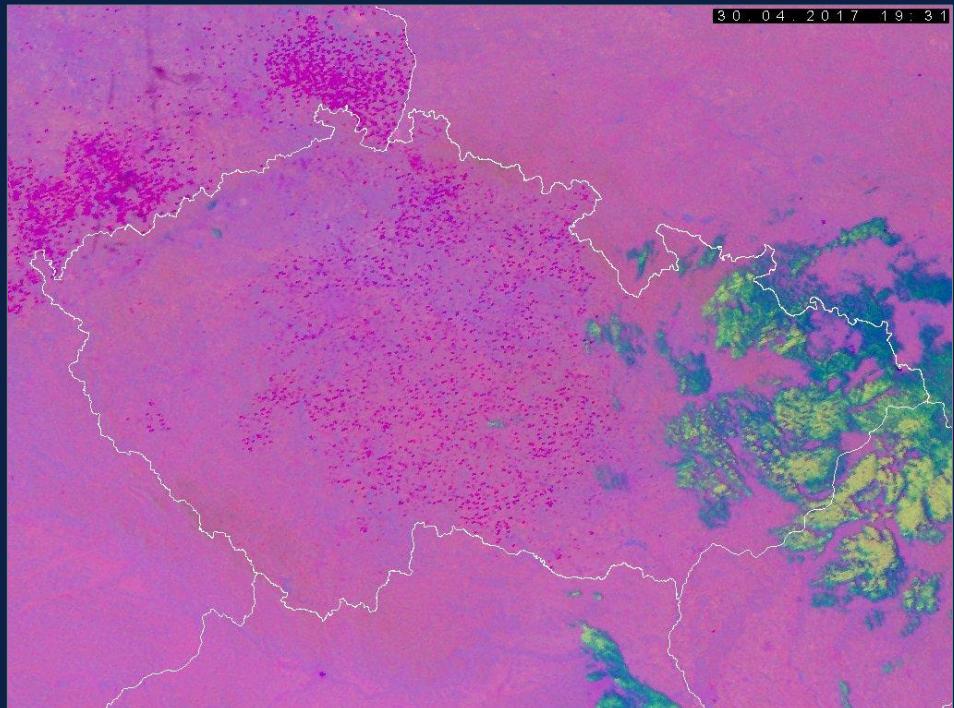


MSG RSS, sandwich HRV & IR10.8, 3 km (E-W) x 6 km (S-N), 10°E, 50°N

30 April / 01 May 2019 – FIRE DETECTION

Beltain (Beltane) night, or Walpurgis night

Source data: NOAA-20 (JPSS-1), VIIRS bands I4 3.74 and I5 11.45 μm (375m, SDR), 01:20 UTC
processed in ENVI, using its [bilinear interpolation](#) and [pixel aggregate](#) resampling methods
simulations of MTG FCI IR 3.8 (3.80 μm) and IR10.5 (10.50 μm) 1 km HR / 2 km NR bands

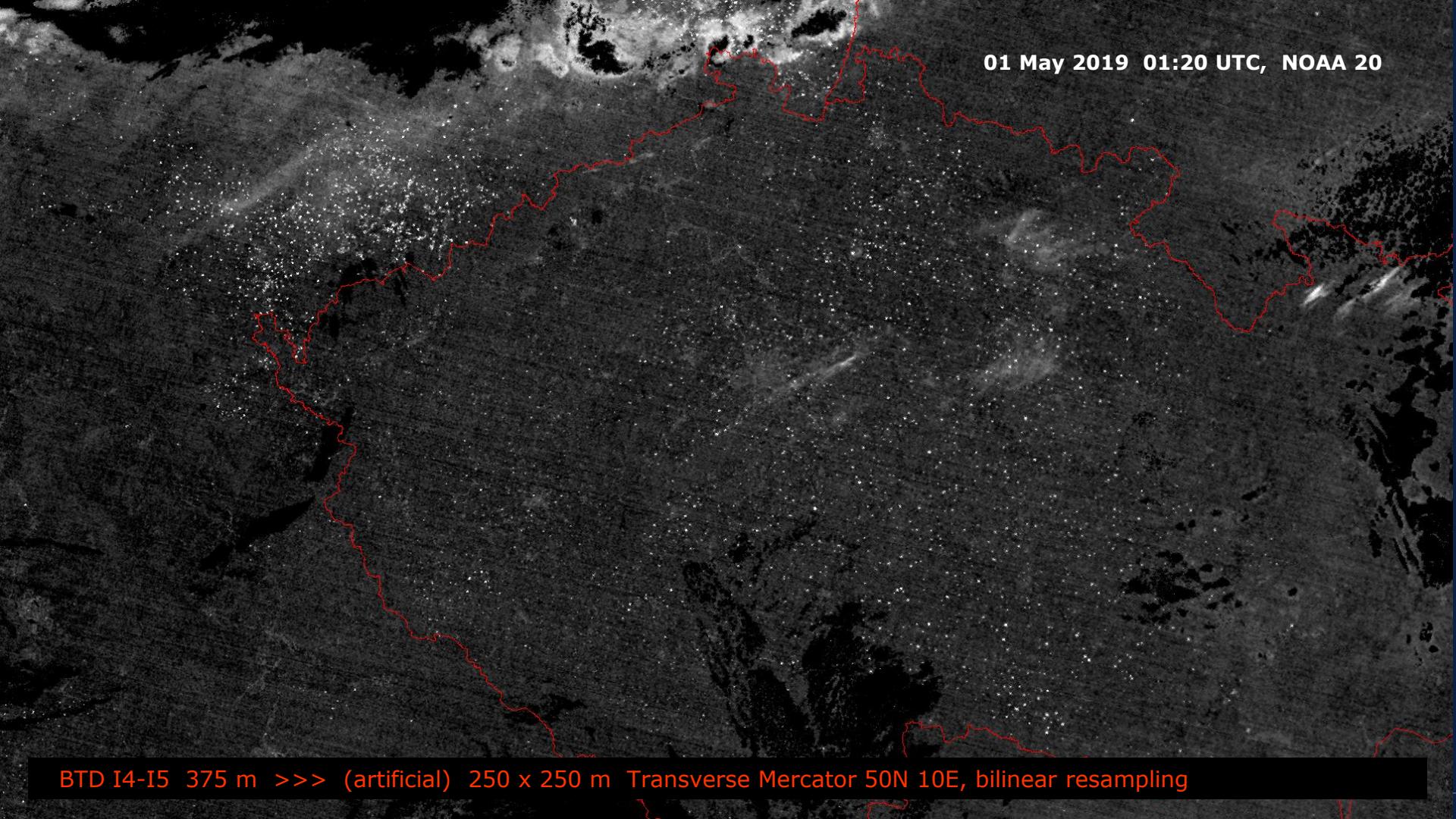


METOP AVHRR, Night Microphysics RGB



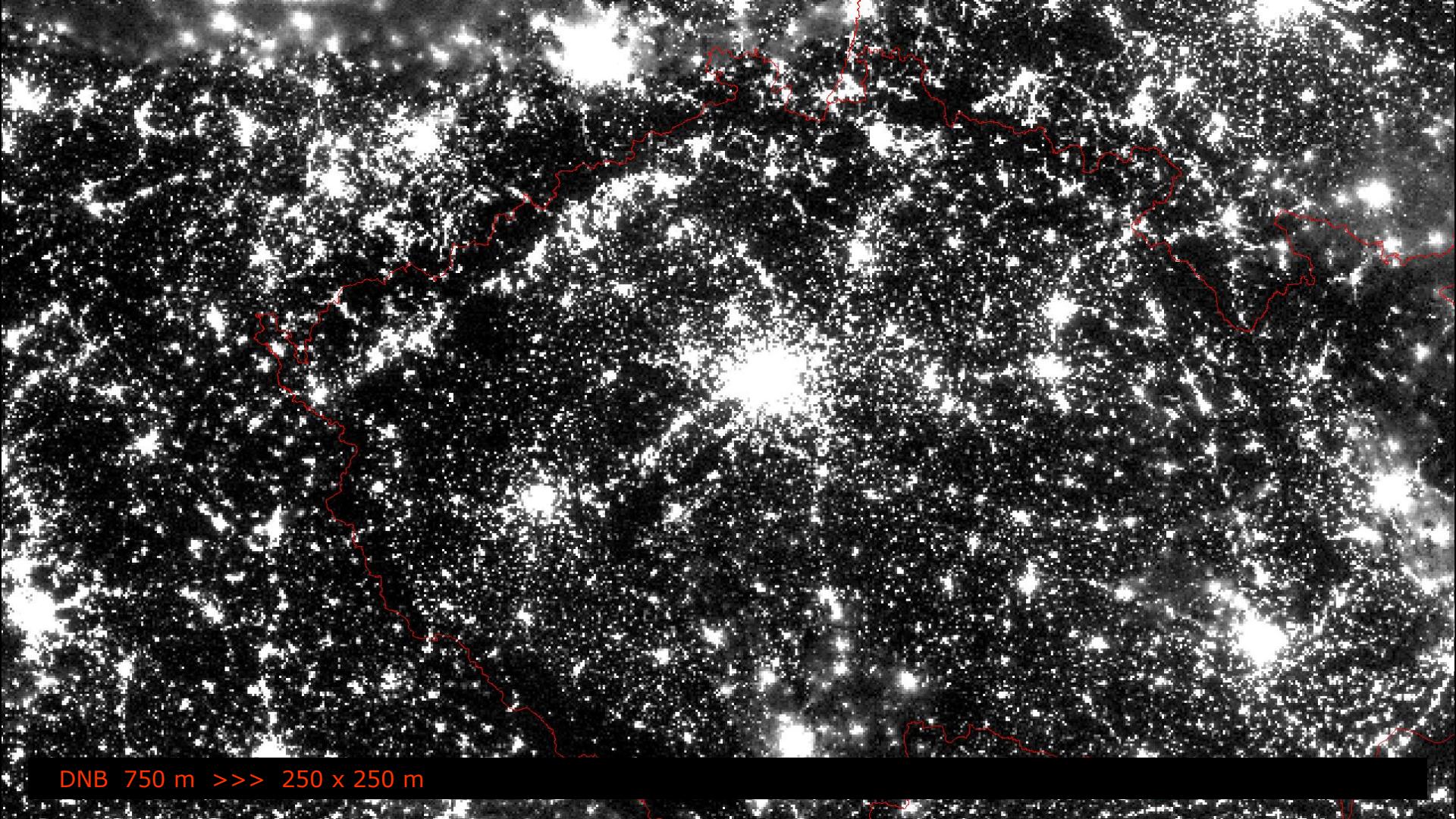
Temperature of bonfire – up to about 1400 K



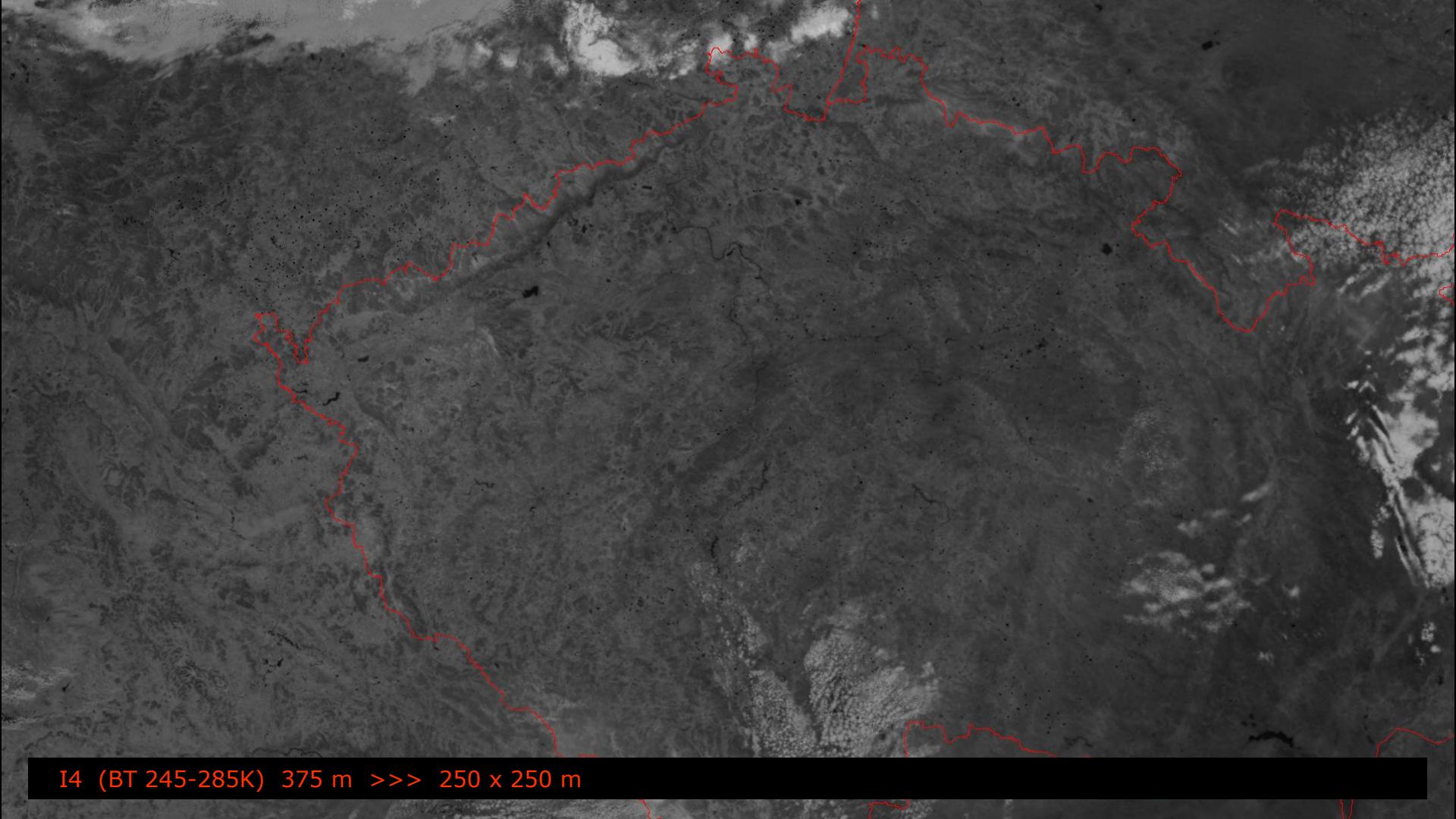


01 May 2019 01:20 UTC, NOAA 20

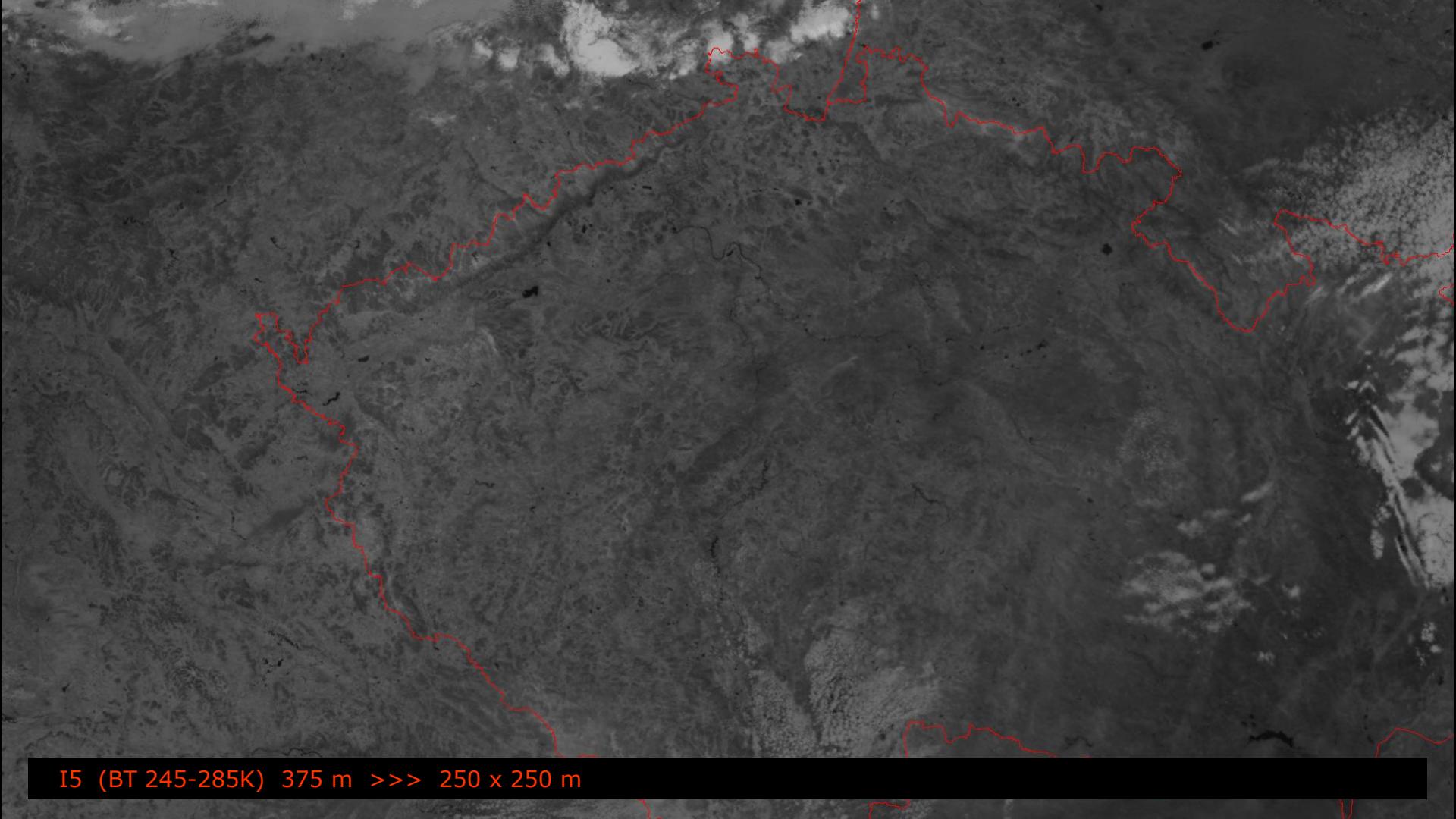
BTD I4-I5 375 m >>> (artificial) 250 x 250 m Transverse Mercator 50N 10E, bilinear resampling



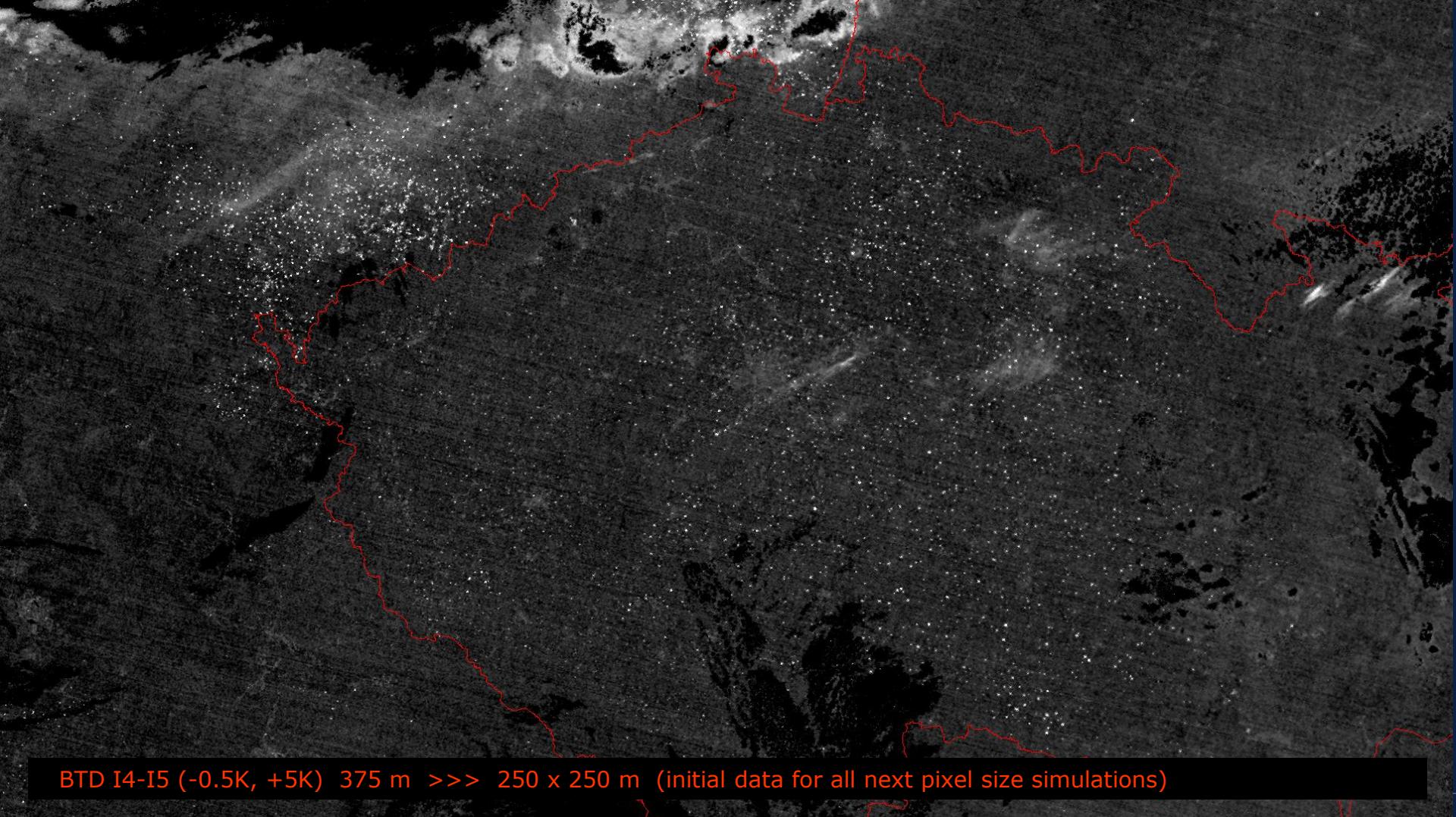
DNB 750 m >>> 250 x 250 m



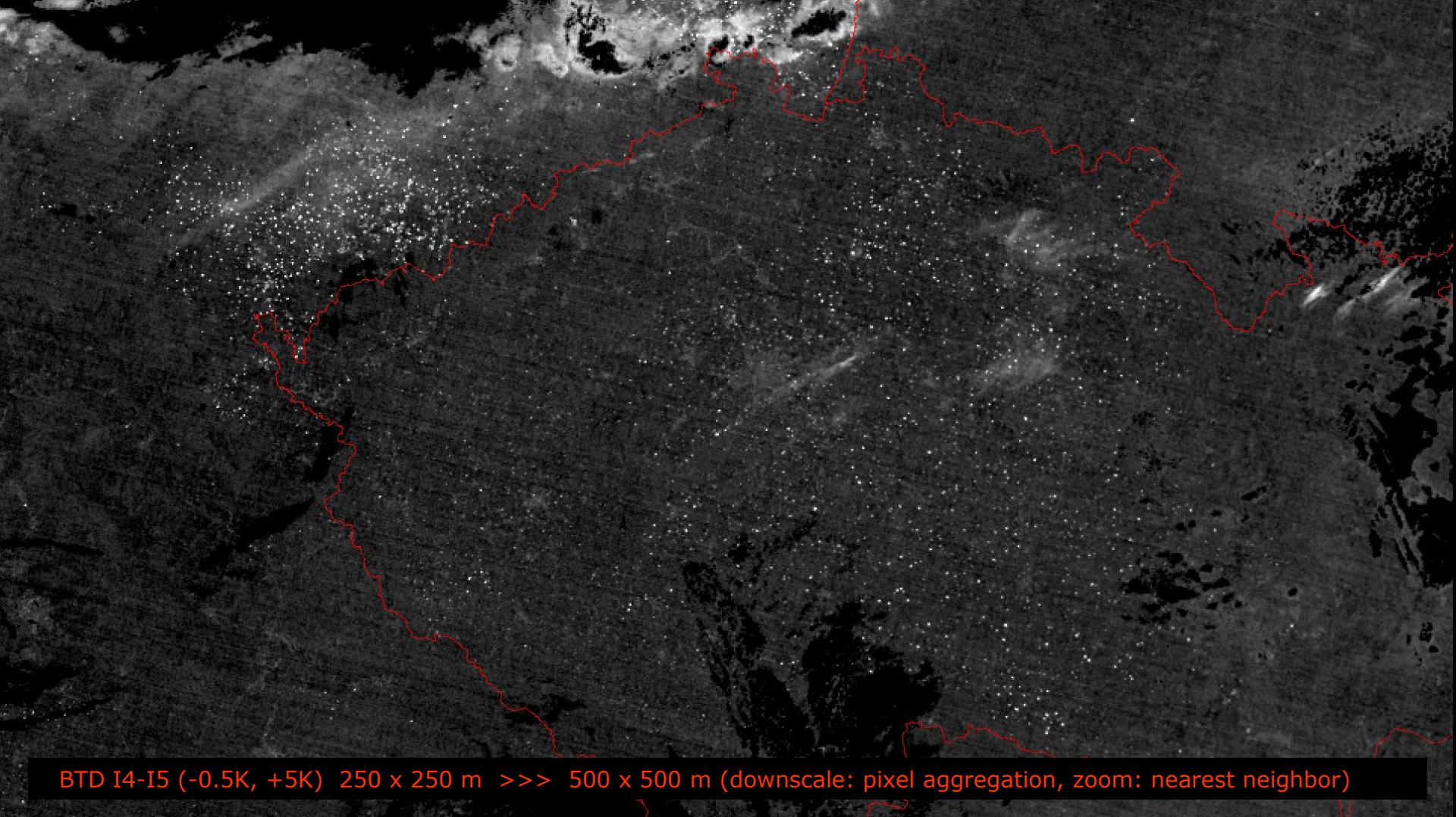
I4 (BT 245-285K) 375 m >>> 250 x 250 m

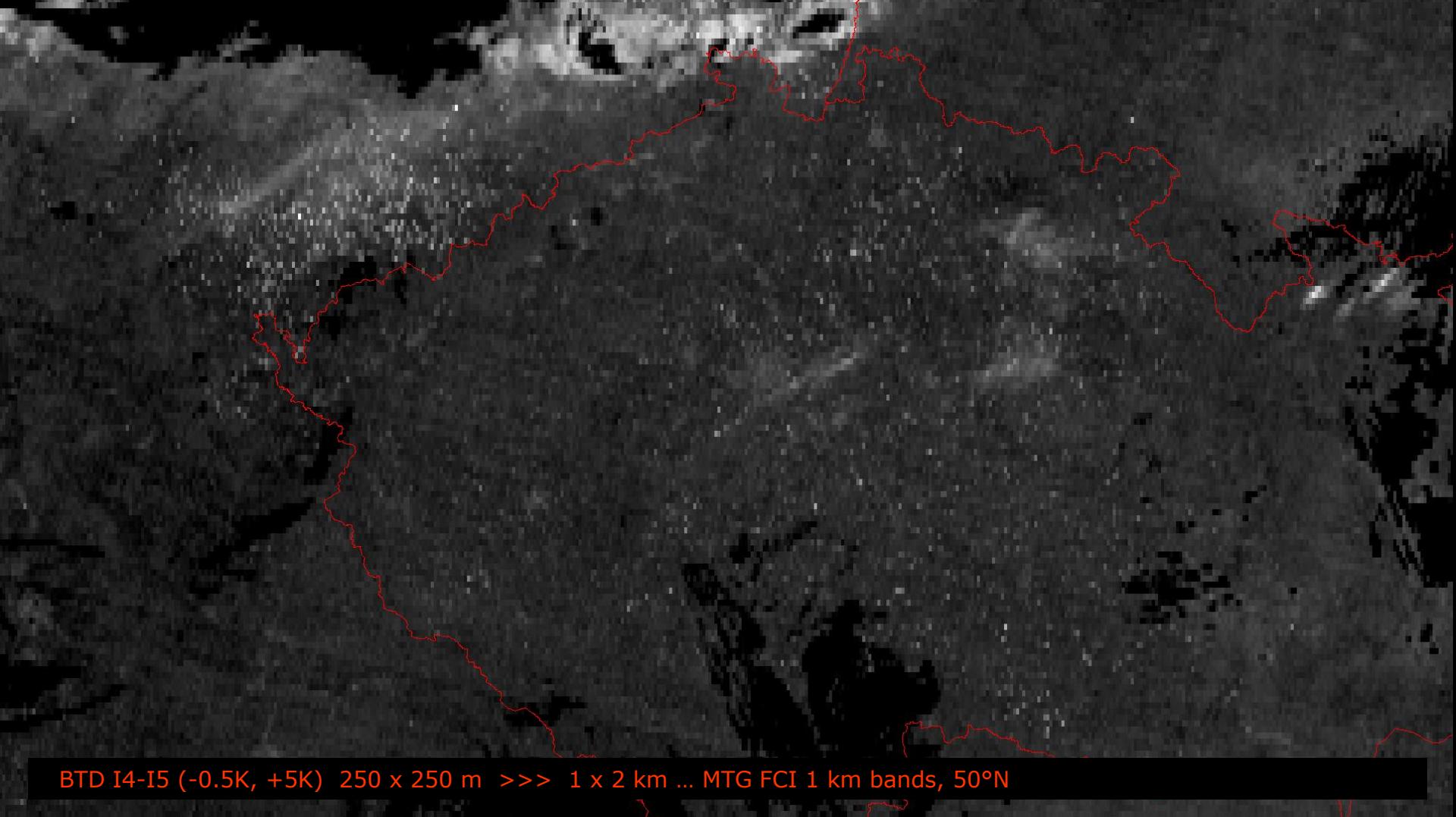


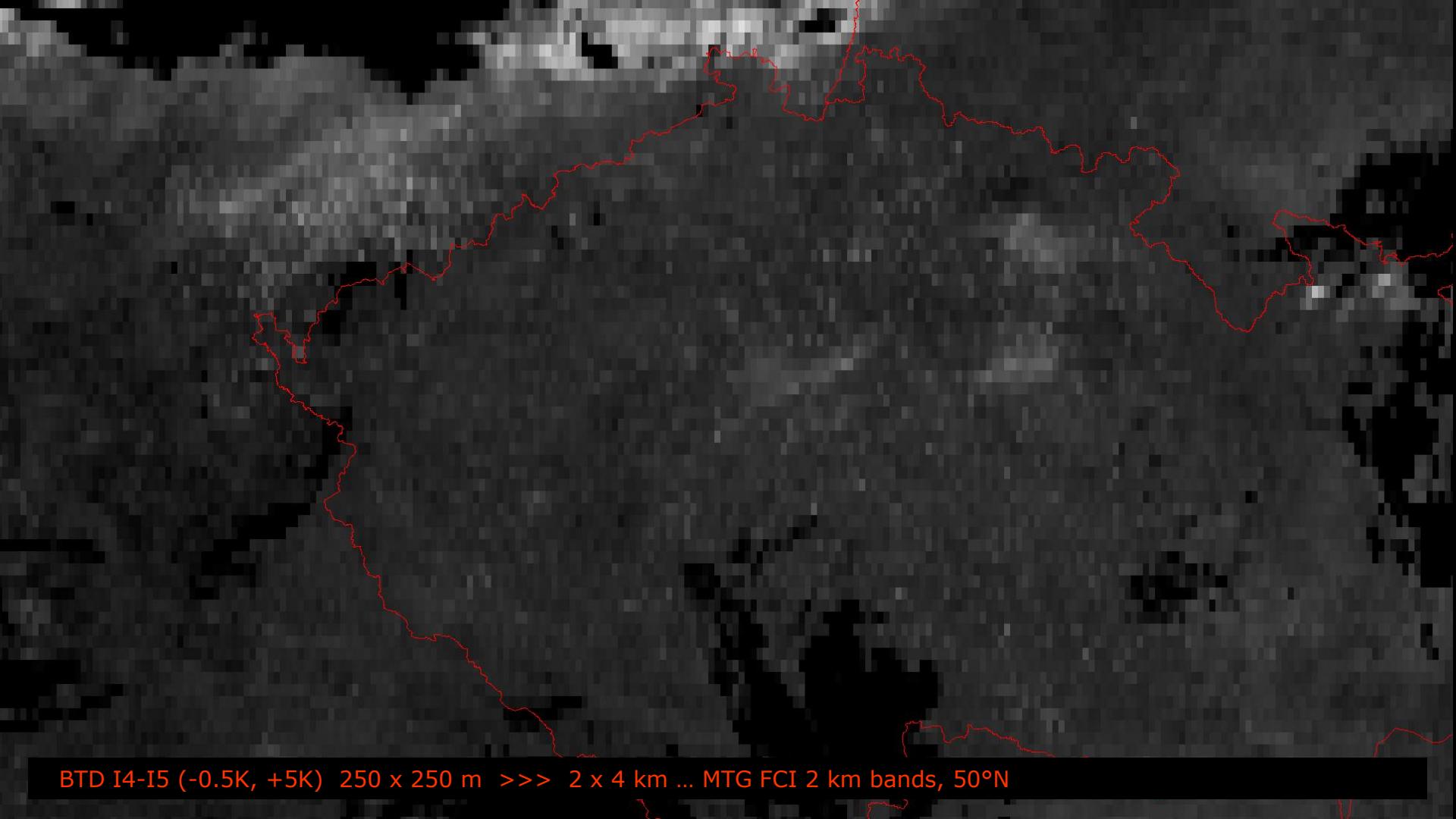
I5 (BT 245-285K) 375 m >>> 250 x 250 m



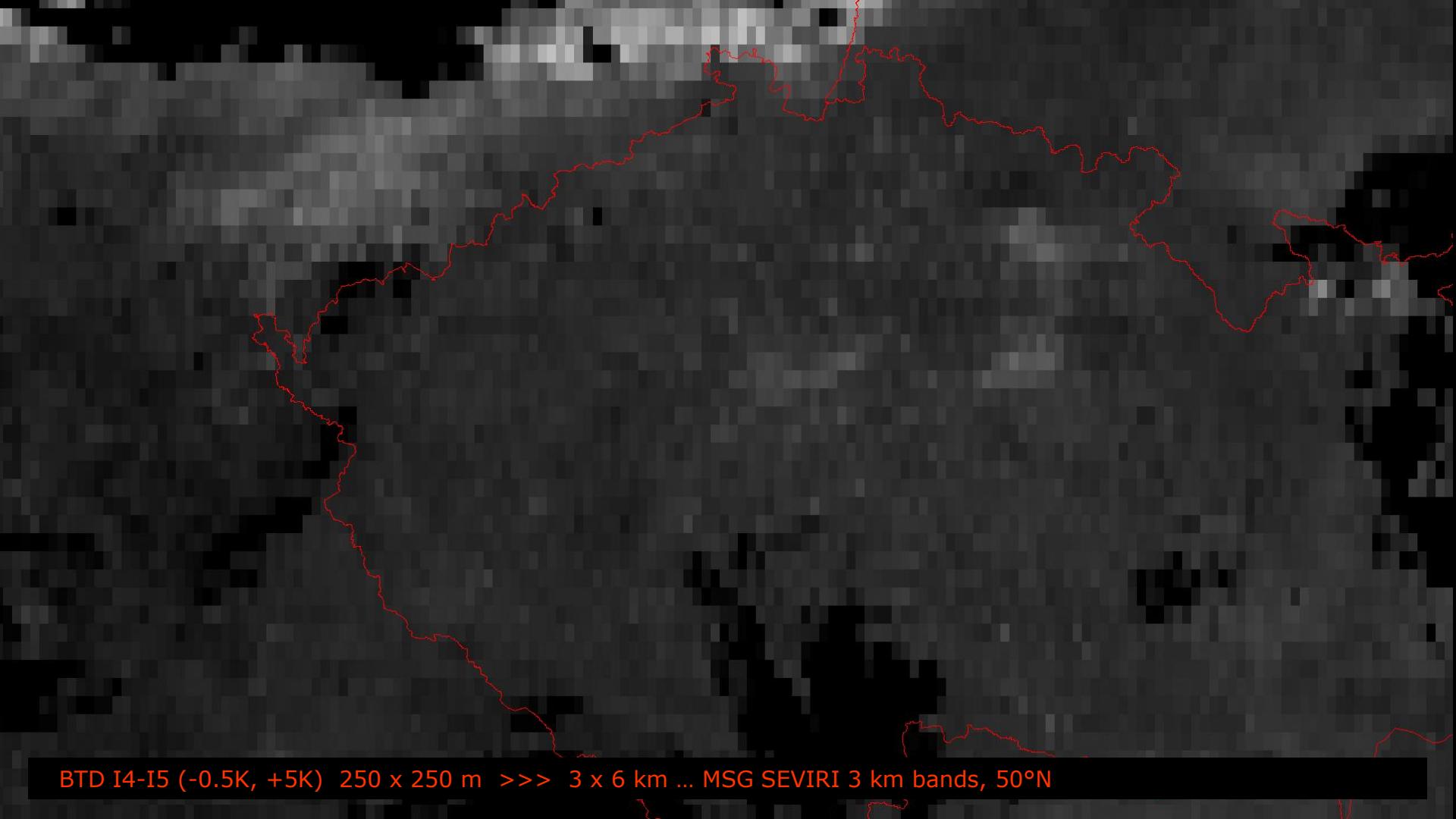
BTD I4-I5 (-0.5K, +5K) 375 m >>> 250 x 250 m (initial data for all next pixel size simulations)



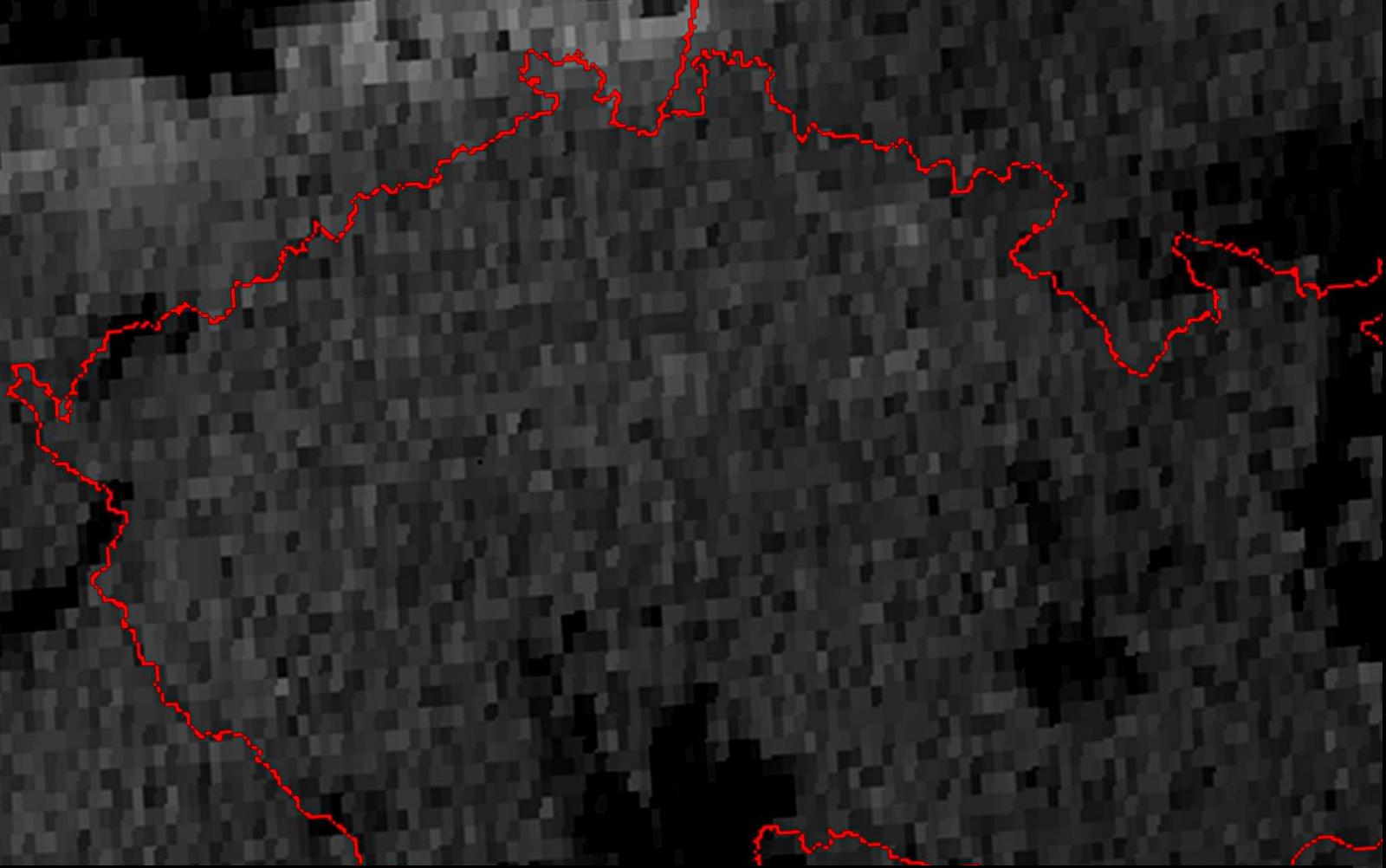




BTD I4-I5 (-0.5K, +5K) 250 x 250 m >>> 2 x 4 km ... MTG FCI 2 km bands, 50°N



BTD I4-I5 (-0.5K, +5K) 250 x 250 m >>> 3 x 6 km ... MSG SEVIRI 3 km bands, 50°N

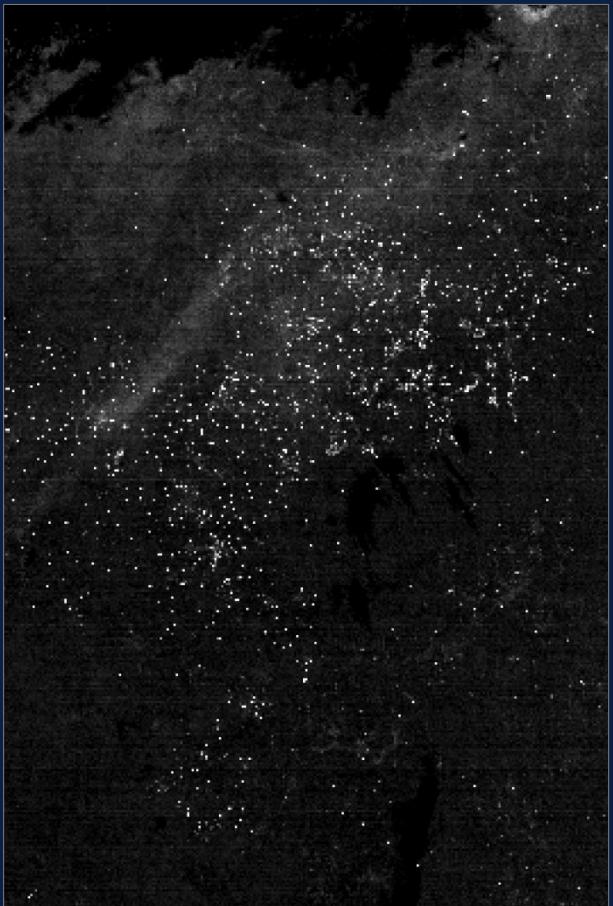


MSG SEVIRI RSS 01:20 UTC, BTD IR3.9 - IR10.8 (~ 3 x 6 km), 50°N

The same as in previous slides, but without the initial projection into Transverse Mercator, using as source data for simulations the 375 m data in original satellite projection – more accurate.

Simulated for nominal meridian (0° or 9.5°E) at nadir view, and at 50°N

Original satellite projection (VIIRS)

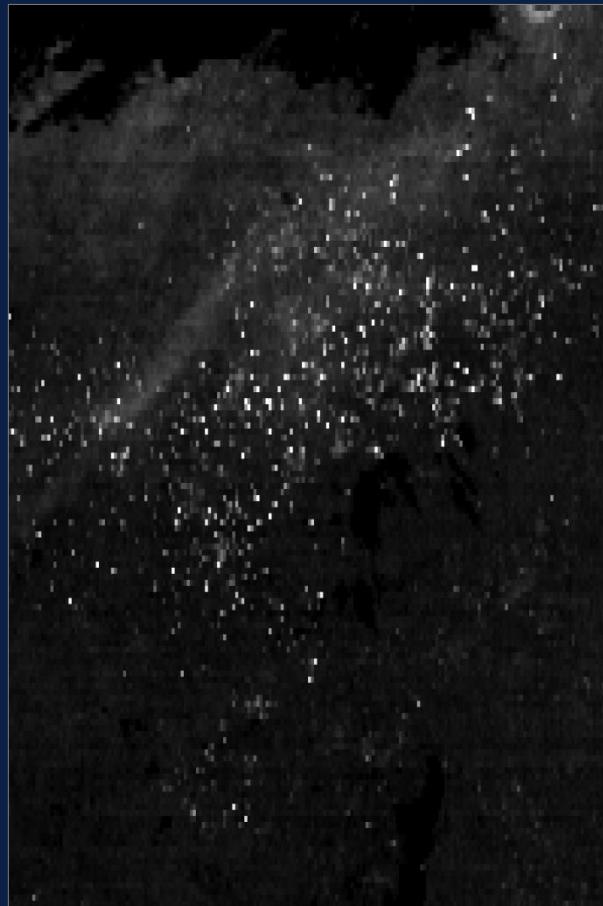


original 375 m data

EPS-SG METimage 0.5 km bands – nadir view



500 x 500 m



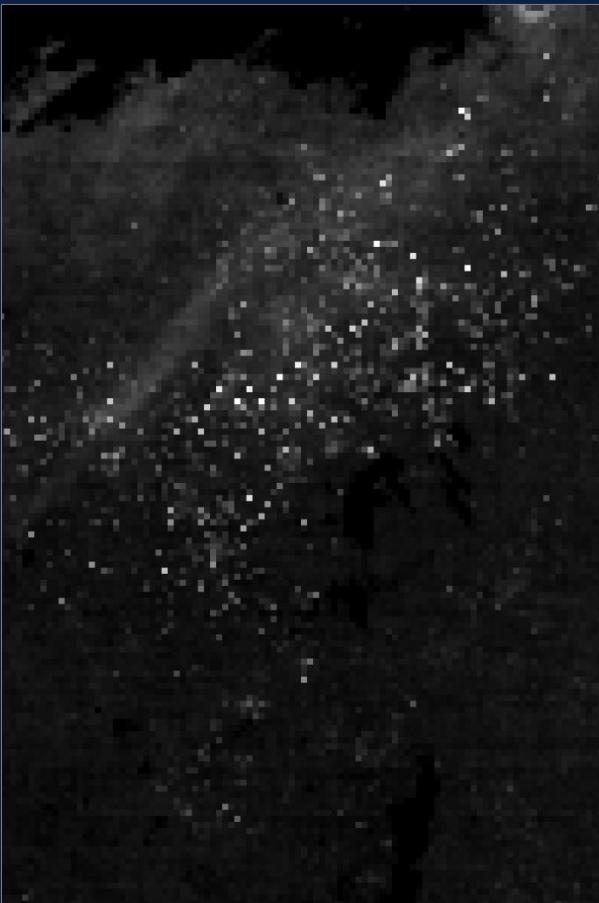
500 x 1000 m

Original satellite projection (VIIRS)



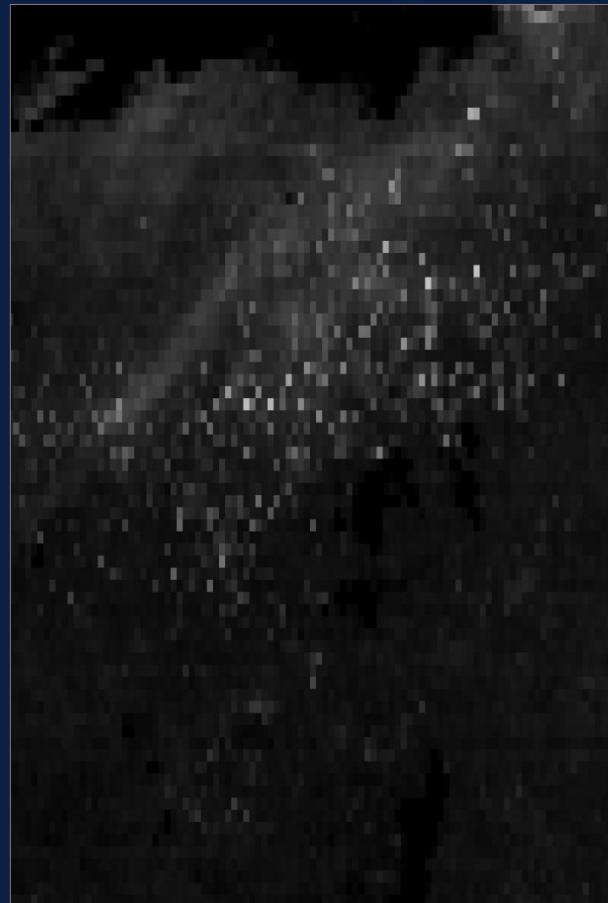
original 375 m data

MTG FCI, 1 km bands – nadir view



1 x 1 km

MTG FCI, 1 km bands – 50°N view



1 x 2 km

Original satellite projection (VIIRS)



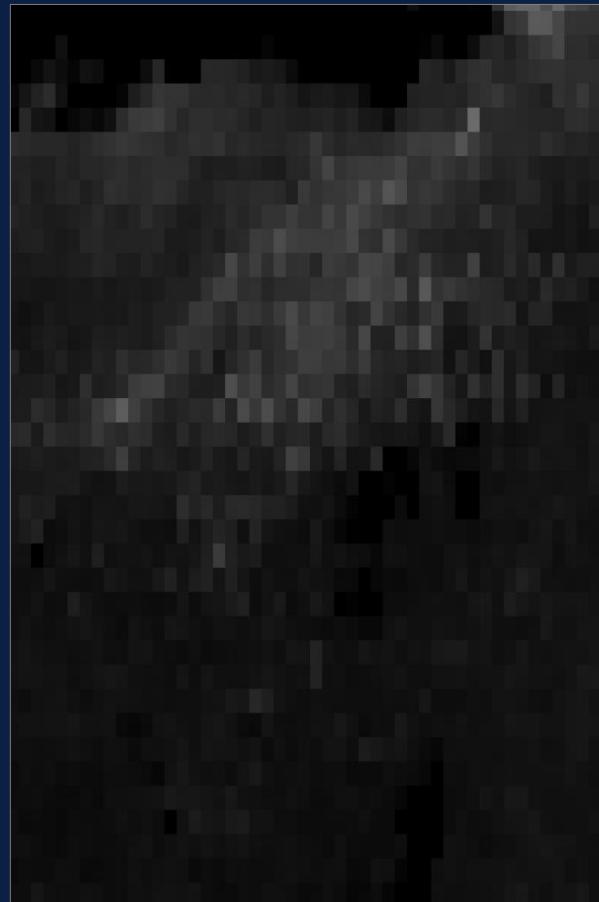
original 375 m data

MTG FCI, 2 km bands – nadir view



2 x 2 km

MTG FCI, 2 km bands – 50°N view



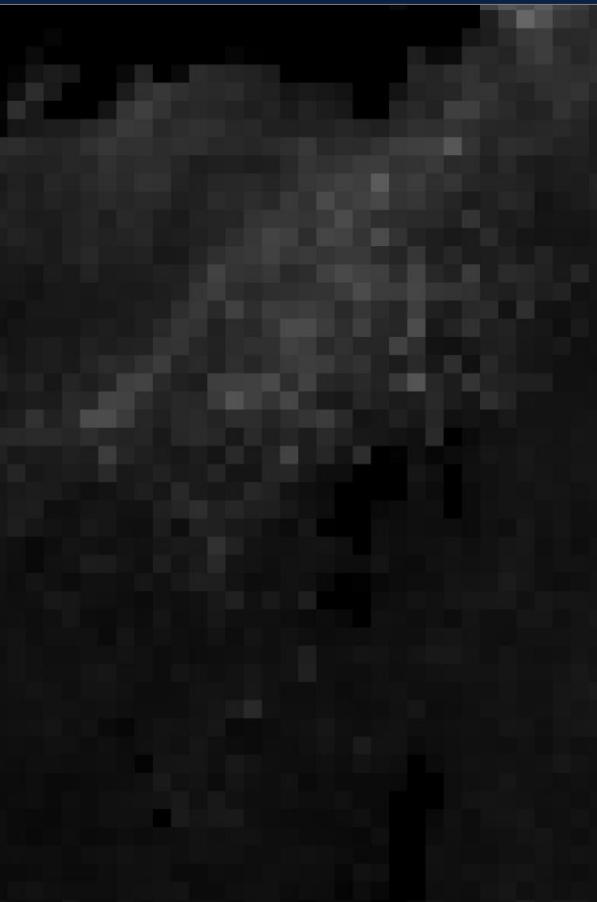
2 x 4 km

Original satellite projection (VIIRS)



original 375 m data

MTG SEVIRI, 3 km bands – nadir view



3 x 3 km

MSG SEVIRI, 3 km bands – 50°N view



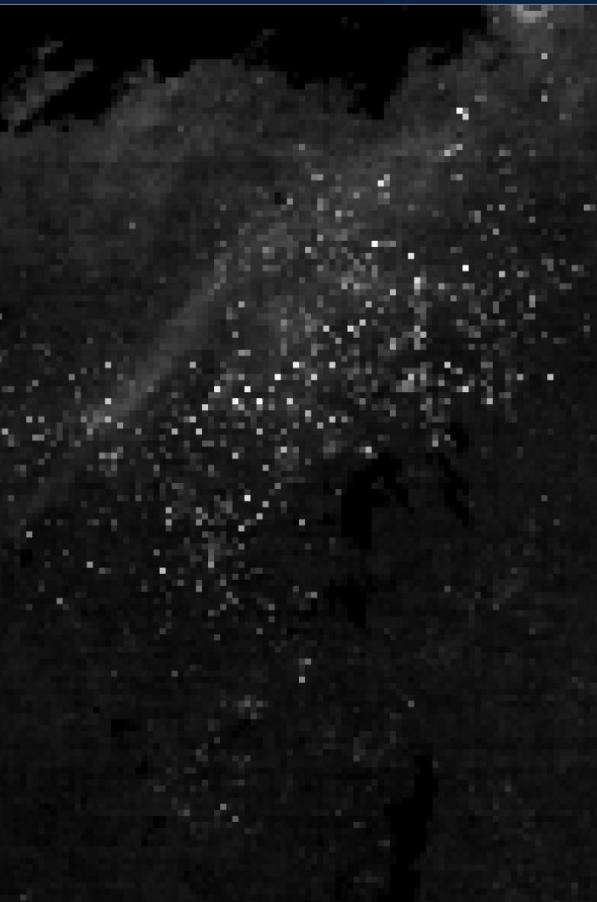
3 x 6 km

Original satellite projection (VIIRS)



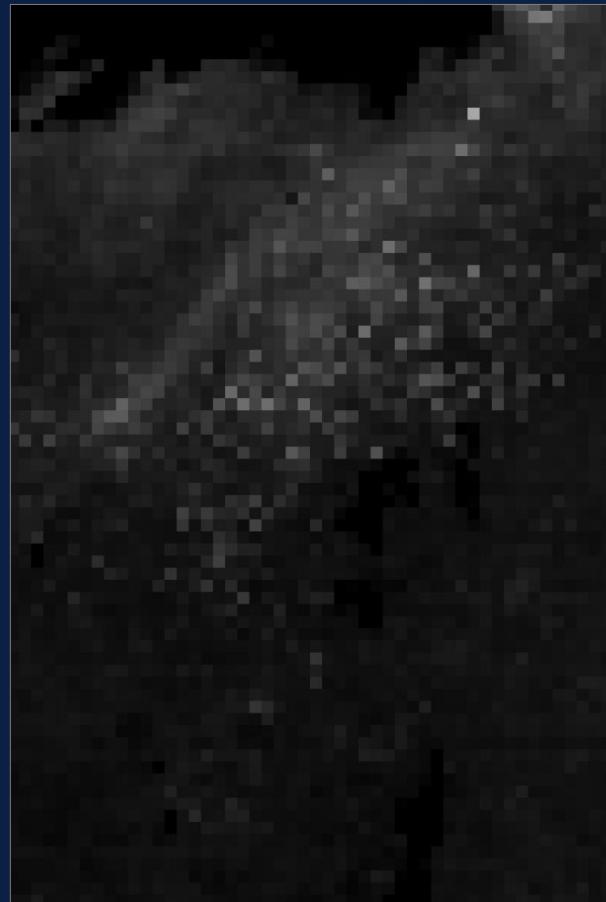
original 375 m data

MTG FCI 1 km HR bands – nadir view



1 x 1 km

MTG FCI 2 km NR bands – nadir view



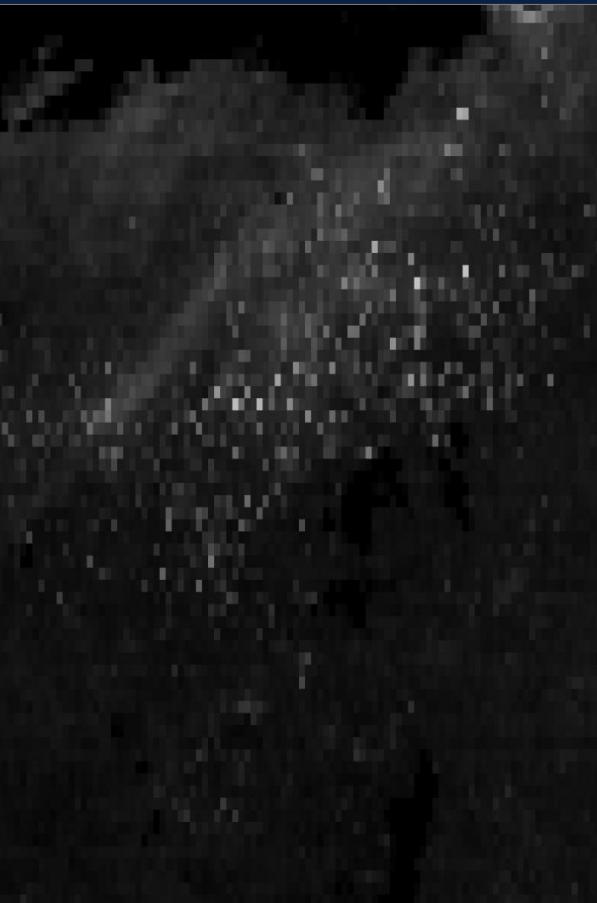
2 x 2 km

Original satellite projection (VIIRS)



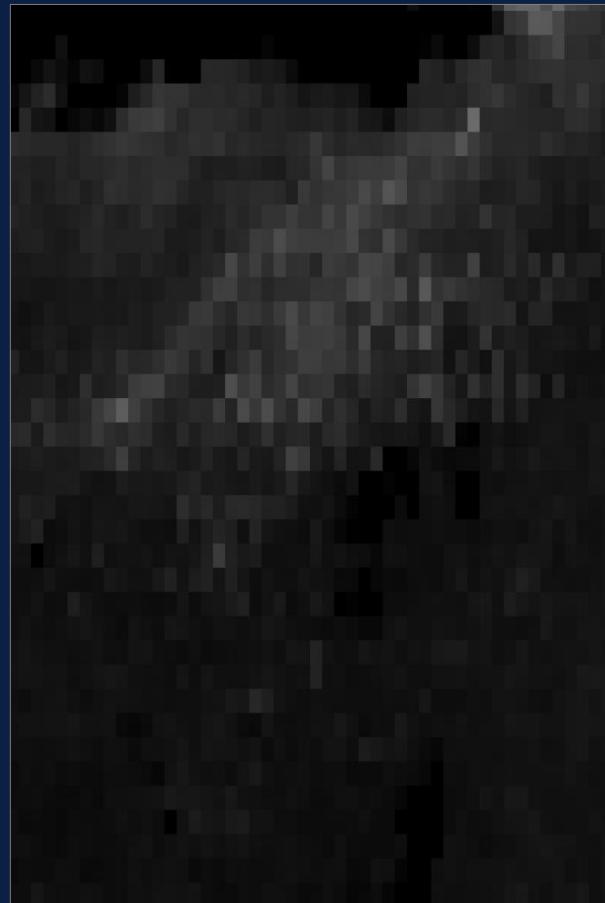
original 375 m data

MTG FCI 1 km HR bands – 50°N view



1 x 2 km

MTG FCI 2 km NR bands – 50°N view



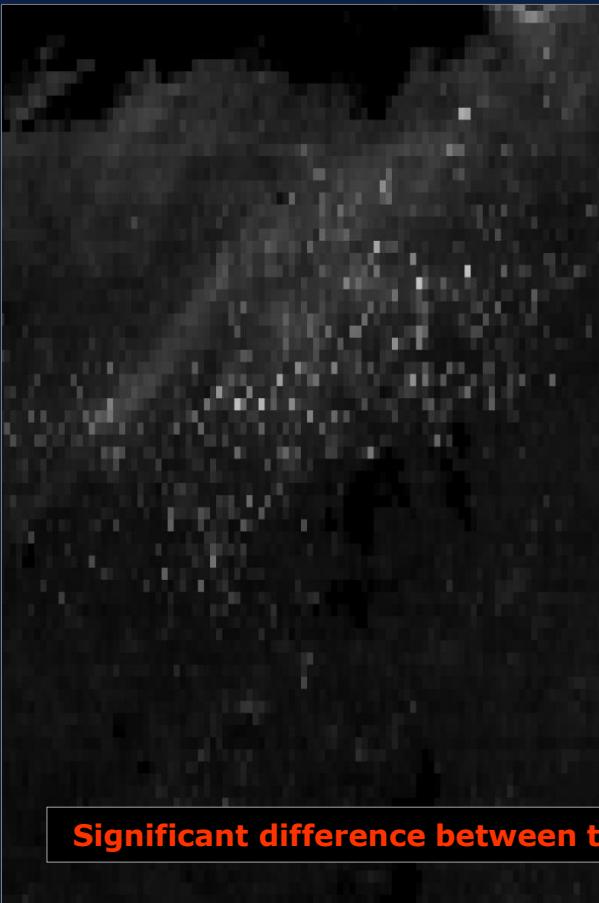
2 x 4 km

Original satellite projection (VIIRS)



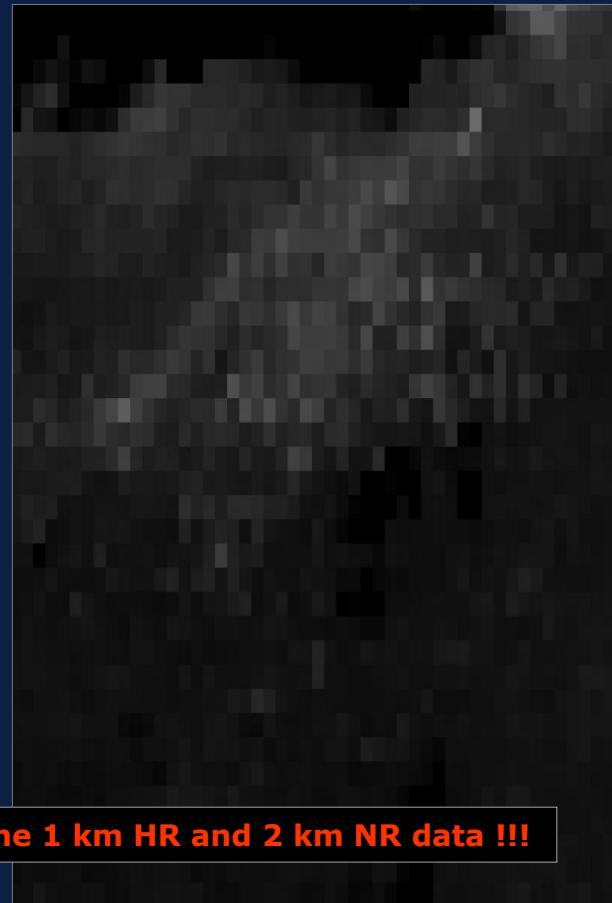
original 375 m data

MTG FCI 1 km HR bands – 50°N view



1 x 2 km

MTG FCI 2 km NR bands – 50°N view



2 x 4 km

Significant difference between the 1 km HR and 2 km NR data !!!

