New Possibilities For Air Quality Monitoring From Space-Borne Remote Sensing: Application Of GRASP Algorithm To S5p/TROPOMI and PRISMA Measurements

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1: GRASP

2: Laboratoire d'Optique Atmosphérique

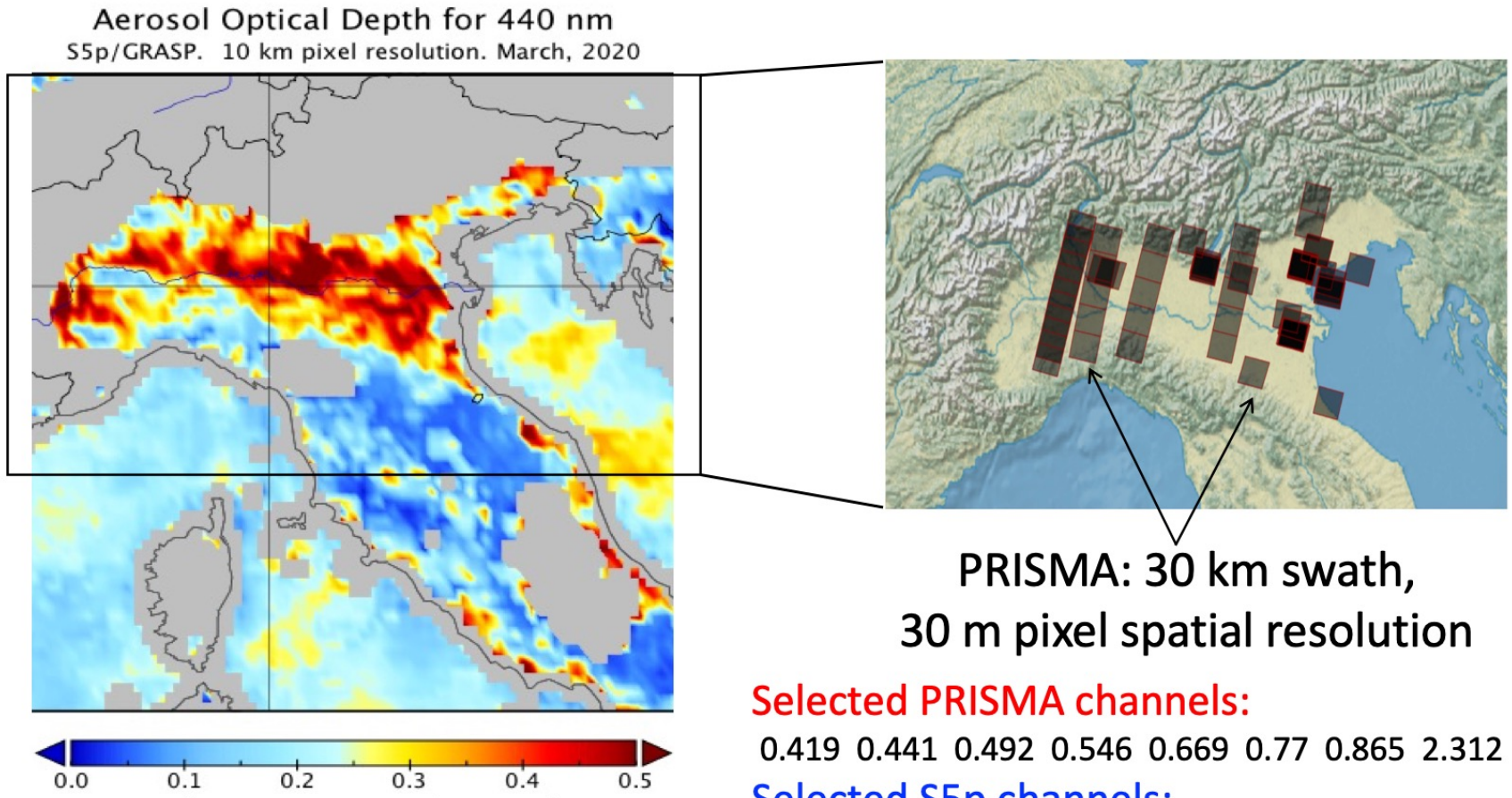
3: Consiglio Nazionale delle Ricerche, Istituto per la BioEconomia

4: istituto per il rilevamento elettromagnetico dell'ambiente

5: cloudflight

6: Koninklijk Nederlands Meteorologisch Instituut, Ministerie van Infrastructuur en Waterstaat

7: esa



S5p/TROPOMI: 2600 km swath,
about 7 km pixel spatial resolution

PRISMA: 30 km swath,
30 m pixel spatial resolution

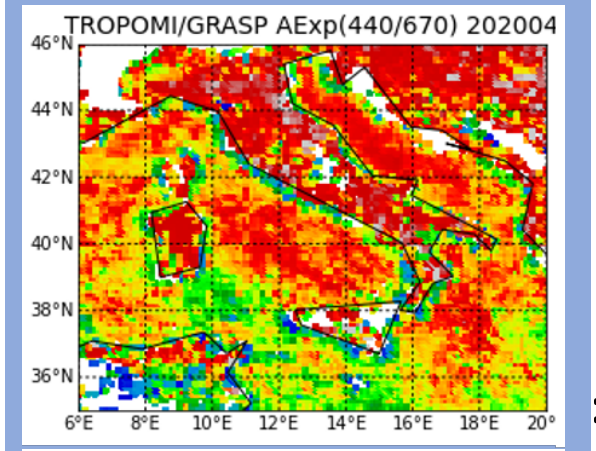
Selected PRISMA channels:

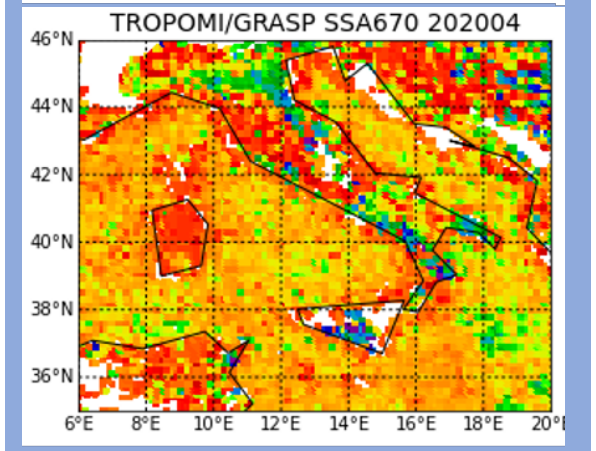
0.419 0.441 0.492 0.546 0.669 0.77 0.865 2.312

Selected S5p channels:

0.340 0.367 0.380 0.416 0.440 0.494 0.670 0.747 0.772 2.313

GRASP/TROPOMI Aerosol Type





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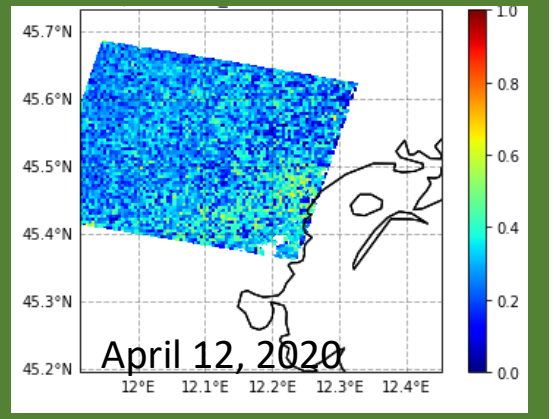
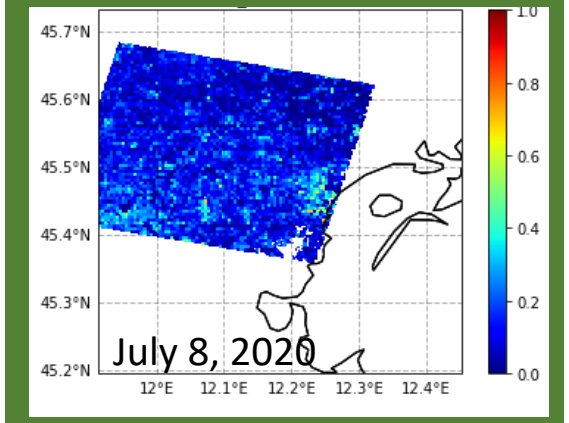
GRASP/PRISMA AOD, 100 m resolution





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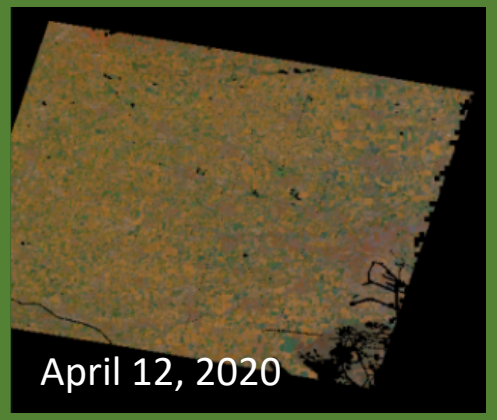
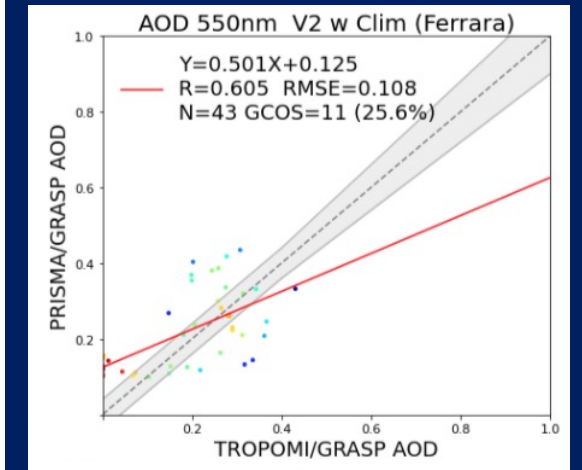
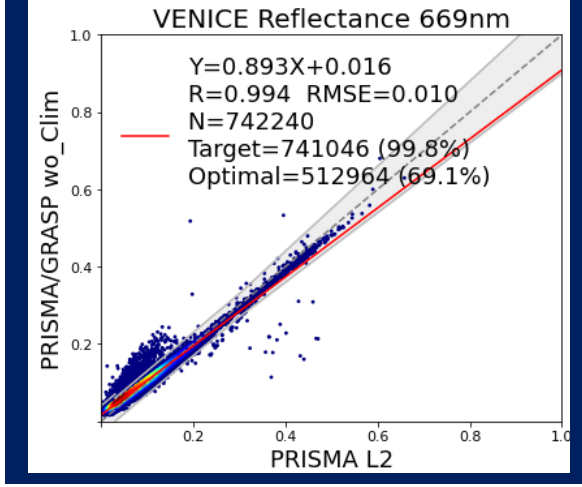
GRASP/PRISMA Surface Reflectance, 100 m



GRASP/PRISMA validation





Conclusions and outlook

1. Combination of the instruments with coarse and fine spatial resolution (for example, S5p/TROPOMI and PRISMA) opens new possibilities for aerosol sources identifications at high spatial resolution and aerosol emission/pollution monitoring.
2. The retrieval from the instrument with coarse resolution and global coverage can provide information about aerosol type and aerosol background.
3. The retrieval from the sensor with fine spatial resolution can use this information to get AOD at high spatial resolution for identification of local aerosol sources and air quality monitoring.
4. The combined retrieval provides enhanced surface reflectance characterization at high spatial resolution.
5. Developed GRASP methodology for the combination PRISMA+S5p can potentially incorporate other satellites like S5p+S2 or S5p+OLCI+S2 etc.