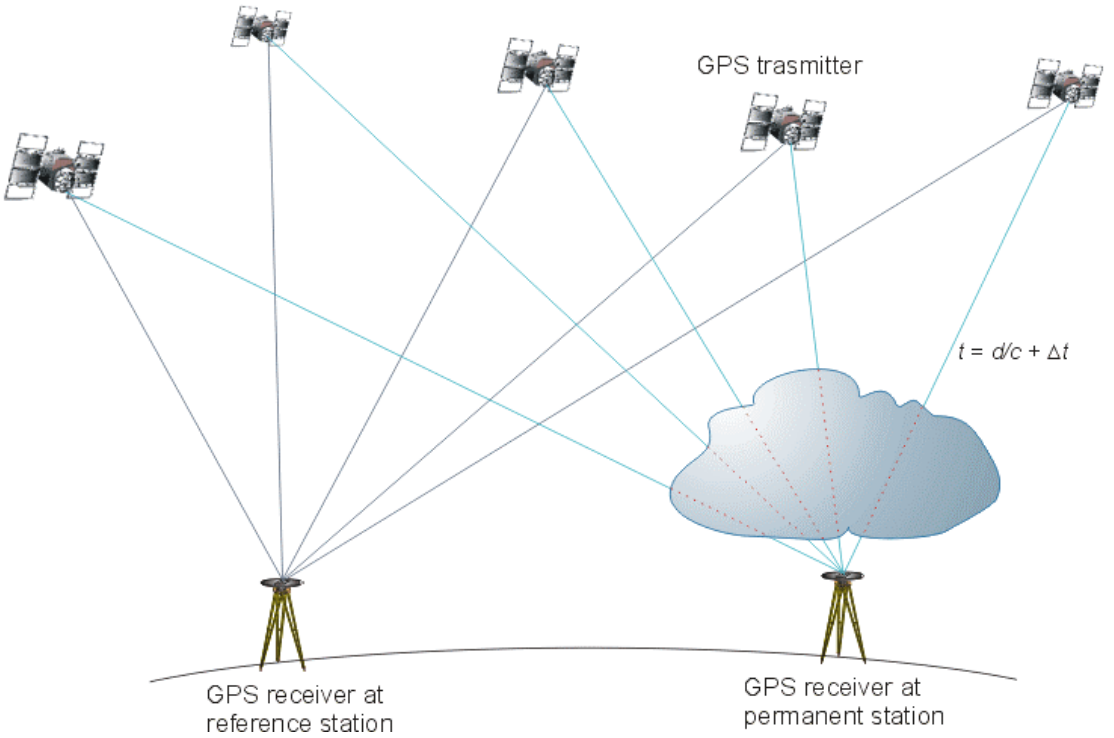
Tropospheric water vapor estimation with GPS

The GPS system is a tool initially designed for positioning and navigation. As widely demonstrated, the GPS can also provide a reliable estimate of the Zenith Tropospheric Delay (ZTD) which can be used to derive the Integrated Water Vapor (IWV) content of the atmosphere.

Measurement principle :

When crossing the atmosphere, the GPS radio signals are sensitive to the refractive index of the atmosphere, which is a function of pressure, temperature and moisture .

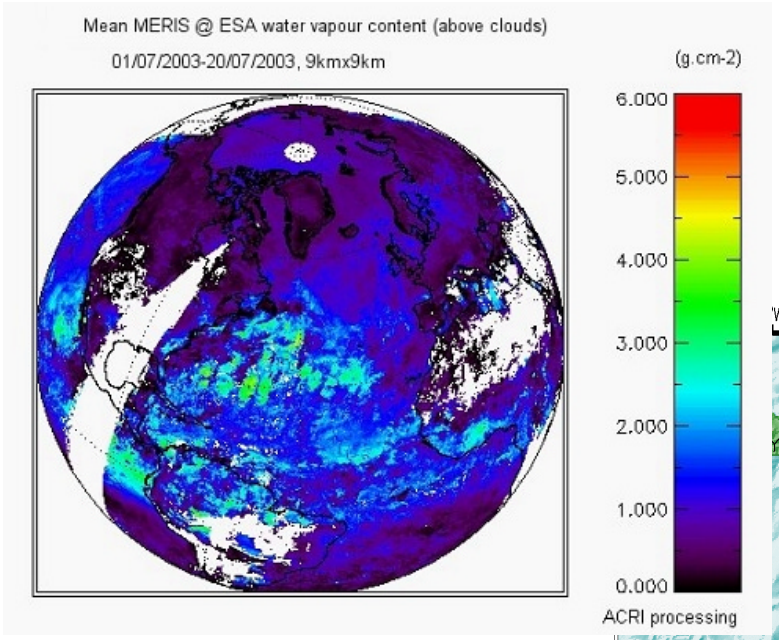


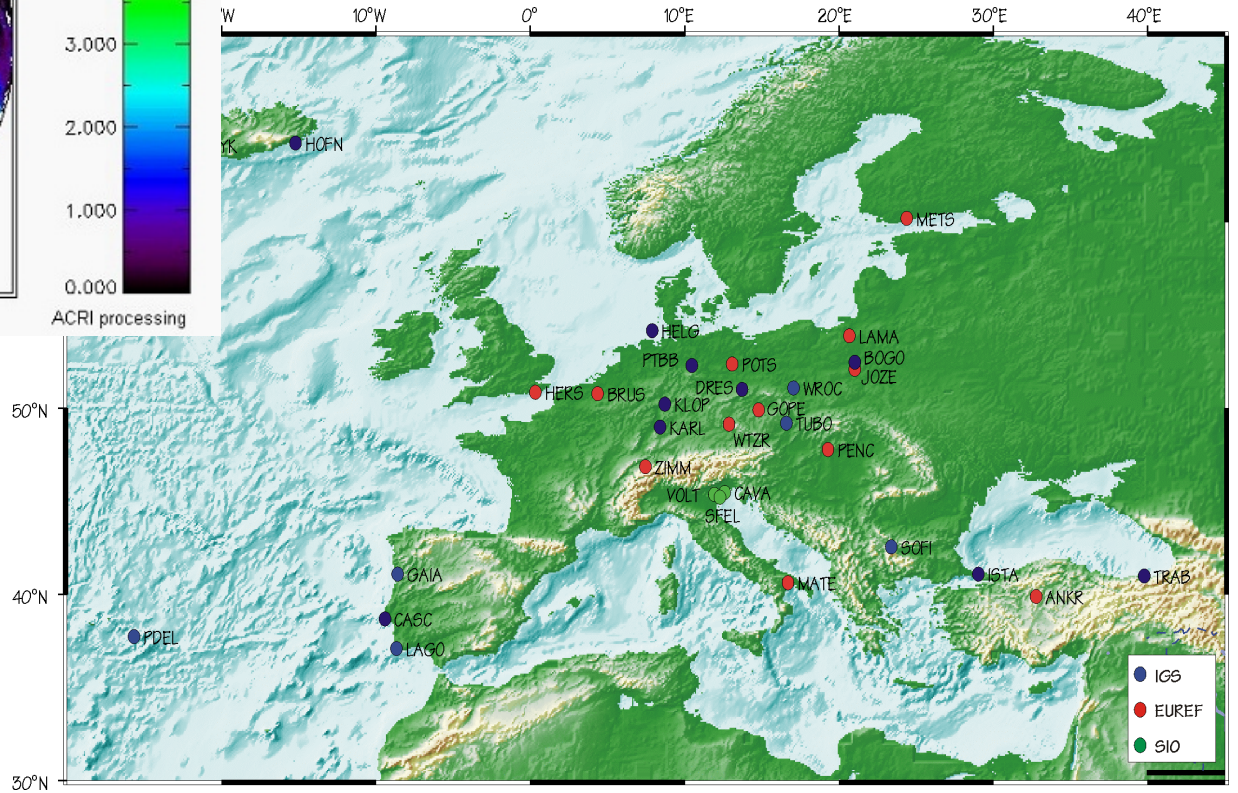
ESA project: MERIS validation
(Category 1 CAL/VAL project nr. 1429)

Participant: Olivia Lesne

Duration: 18 months

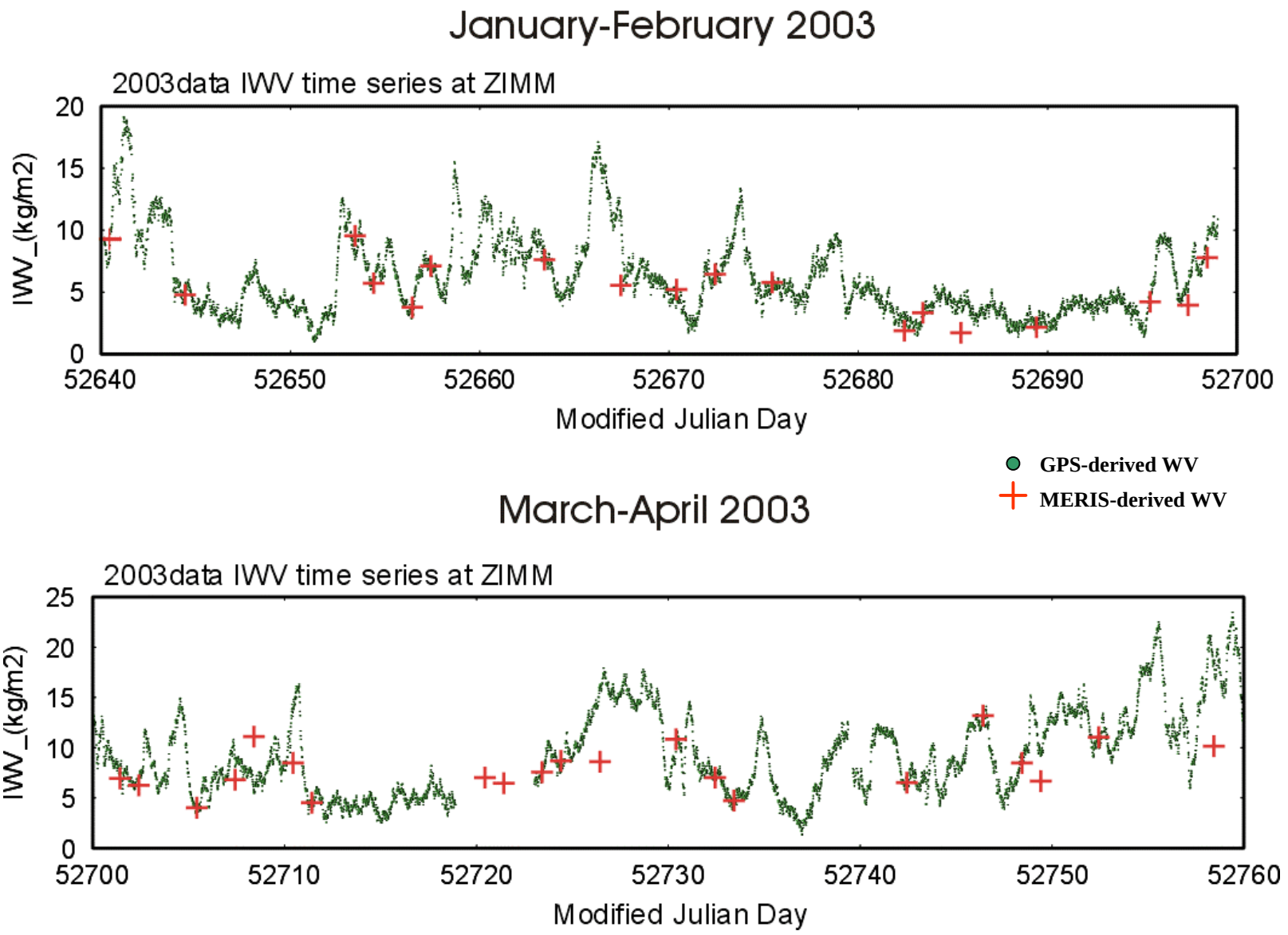
Objective: to calibrate the MERIS water vapor products (level 2) by a comparison with GPS-derived integrated water vapor





GPS stations for which water vapor is processed with GPS

Comparison between GPS-derived and MERIS-derived water vapor Station ZIMM (Zimmerwald, Switzerland)



Comparison between GPS-derived and MERIS-derived water vapor Station GOPE (Pecny, Czech Republic)