

TRaCK Your ATmosphere: Open Learning Materials for Vocational Education and Training. Final Report

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In the framework of ERASMUS+ program Key Action “Cooperation for innovation and the exchange of good practices” with an Action Type “Strategic Partnerships for vocational education and training”, our project TRack Your ATmosphere (TRYAT) was approved in august 2017 and is co-funded by the European Union..

The project is going to end next August 2020. Here we present the final report on the achieved objectives.

The projects total duration is 35 months and the participants are teachers, researchers and students from three vocational schools and Research/University Institutes in France, Germany and Italy.

We show the achievements so far for each expected intellectual Output (O)

O1- Learning Plattform. (www.tryat.eu)

The Learning Web Platform is an interactive and versatile tool. It helps learners, teachers, researchers and other involved personnel to crosslink, enhance intercultural teambuilding and work on the related technological and environmental issues. The platform gives even access to online real-time and archived data, maps, evaluation and graphical visualization.

O2- Starter Kit

We have been realizing a starter kit of a system to acquire and manage data from both GNSS and weather stations. The kit enables us testing not only the technology, but even the concept itself.

O3- OER Learning Material ‘Physical and Technical Foundations’

It is an interactive physics course where students learn the foundations of three relevant main topics of the project: satellite technology, propagation of waves and physics of the atmosphere. The corresponding competences are elaborated for the use in different VET curricula.

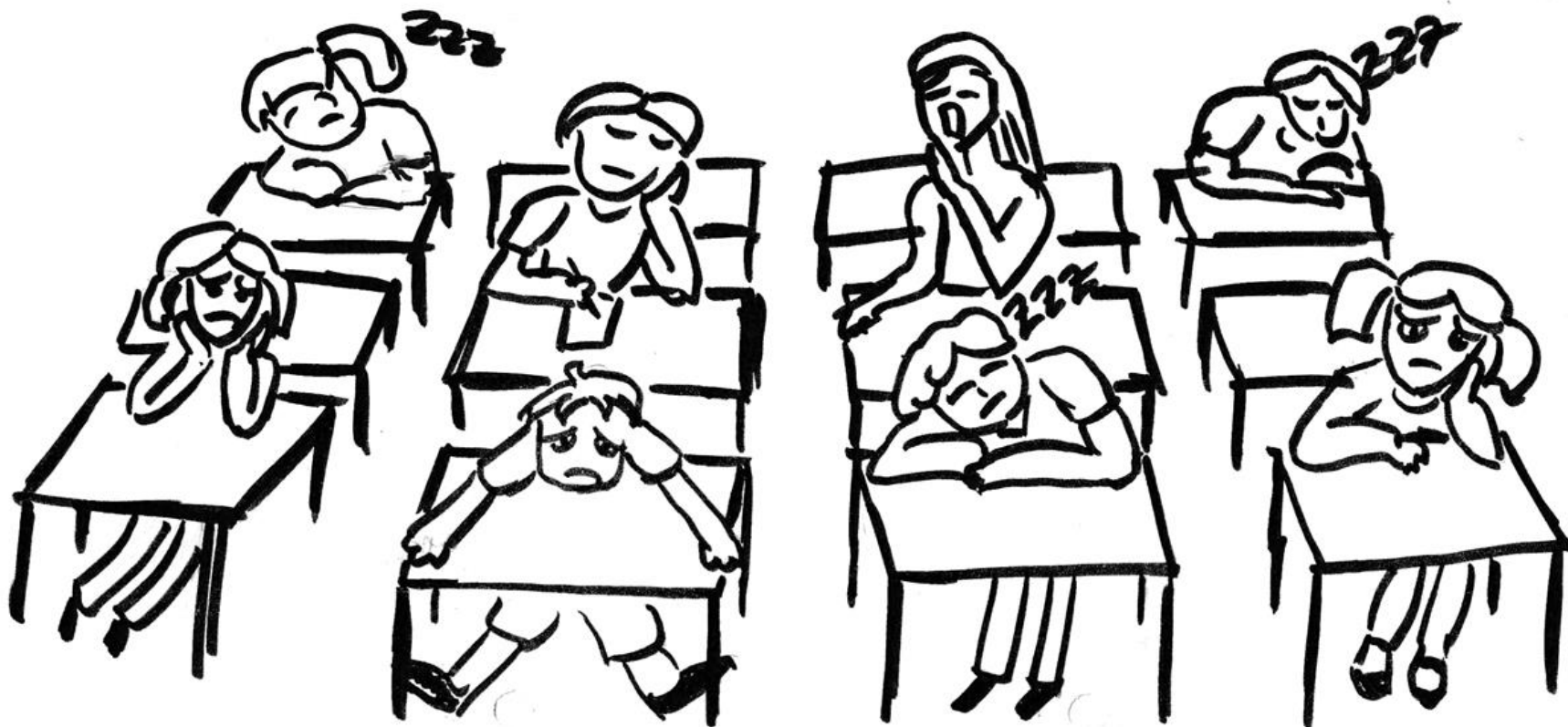
O4- OER Learning Material 'Informatics and Electrical Engineering'

We have developed an interactive learning unit (“learning environment”) with focus on informatics and electronics. The students are given just a problem, namely the collecting of environmental data. This problem is proposed to them in the form of an order from industry “Monitoring of renewable energy plant – measuring wind and sun strength as well as the electrical power”.

O5- Educational videos.

A series of 5-minute long videos have been realizing in all the official languages of the participating countries. The videos deal with the scientific subjects pertaining the project and report on the results themselves, and the way the student worked as teams to achieve them. Different subtopics will be presented in short videos, as a desirable way of dissemination.

How can we motivate undergraduate students and VET learners?



Track your atmosphere



Track your atmosphere



Status 11:13

Breite: 52,4303866°
Länge: 13,4747054°
Zeit: 11:13:49
TTFF: 31 sec
Höhe: 106,9 m
Höhe (MSL): 63,8 m
Acc: 6,0 m
v: 0,0 km/h
PDOP: 1,6
Sats: 21/21
Kurs: 17/26
Kurs-Acc: 6,0 m

Signal to noise

ID	GNSS	CF	C/N ₀	Flags	Elev	Azim
5	USA	L1	22,0	AEU	11,0°	32,0°
7	USA	L1	23,0	AEU	1,0°	345,0°
16	USA	L1	38,0	AEU	57,0°	284,0°
20	USA	L1	27,0	AEU	29,0°	88,0°
21	USA	L1	32,0	AEU	9,0°	208,0°
26	USA	L1	38,0	AEU	8,0°	2,0°
27	USA	L1	42,0	AEU	26,0°	53,0°
29	USA	L1	33,0	AEU	17,0°	105,0°
31	USA	L1	37,0	AEU	1,0°	176,0°
3	RUS	L1	33,0	AEU	54,0°	287,0°
4	RUS	L1	24,0	AEU	18,0°	333,0°
5	RUS	L1	40,0	AEU	62,0°	39,0°
9	RUS	L1	28,0	AEU	50,0°	268,0°
11	RUS	L1	36,0	AEU	7,0°	41,0°
12	RUS	L1	38,0	AEU	18,0°	127,0°
20	RUS	L1	19,0	AEU	18,0°	127,0°
21	RUS	L1	41,0	AEU	18,0°	127,0°
193	JPN	L1	19,0	AEU	18,0°	127,0°
5	CHN	L1	27,0	AEU	18,0°	127,0°

Your Own Position
(Maps: XX.XXX, YY.YYY)

Altitude
(MSL = Main Sea Level; „normal Null“)

Velocity

Measurement Precision
(Position Dilution of Precision;
<4.0 = gut; >7.0 schwach)

Status 20:59

Breite: 52,4304953°
Länge: 13,4577663°
Zeit: 20:59:57
TTFF: 31 sec
Höhe: 116,7 m
Höhe (MSL): 73,7 m
Acc: 6,0 m
v: 0,0 m/s
PDOP: 2,7
Sats: 17/26
Kurs: 17/26
Kurs-Acc: 6,0 m

Carrier frequency

ID	GNSS	CF	C/N ₀	Flags	Elev	Azim
30	USA	L1	37,0	AEU	27°	197°
13	USA	E1	31,0	AEU	31°	274°
2	USA	L1	30,0	A	1°	
6	USA	L1	29,0	AEU	35°	221°
24	USA	L1	28,0	AEU	20°	252°
5	USA	L1	28,0	AEU	19°	303°
2	USA	L1	26,0	AEU	38°	283°
17	USA	L1	26,0	AEU	29°	303°
16	USA	L1	25,0	AEU	21°	54°
11	RUS	B1C	25,0	AEU	17°	290°
7	USA	L1	24,0	AEU	57°	171°
8	USA	L1	24,0	AEU	46°	92°
26	USA	L1	24,0	AEU	11°	29°
9	USA	L1	23,0	AE	22°	30°
15	USA	E1	23,0	AE	16°	221°
9	USA	L1	21,0	AEU	74°	73°
3	USA	E1	21,0	AEU	73°	86°
14	USA	B1C	21,0	AEU	13°	293°
10	USA	B1C	20,0	AEU	32°	82°
23	USA	L1	19,0	AEU	36°	80°
19	USA	B1C	18,0	AE	10°	115°
9	USA	B1C	18,0	AE	5°	80°
1	USA	L1	16,0	AE	75°	348°
7	USA	B1C	16,0	AE	27°	58°

Galileo(EU)

GPS (USA)

GLONASS (Russ.)

QZSS (Japan)

BeiDou/COMPASS (China)

coordinates (Sat.)
Elev = Elevation
Azim = Azimut

Comprehensive Handbook with physical background and many (home) experiments

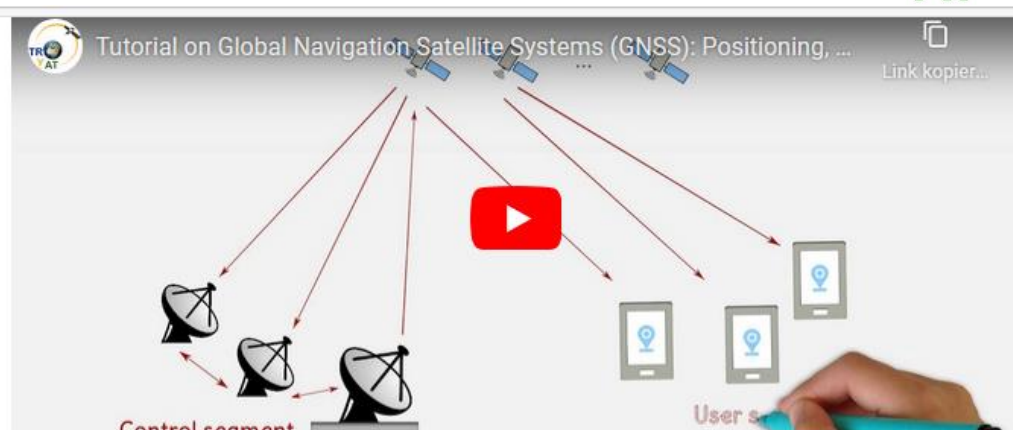
- Mechanical Vibration and Waves
- Refractive Index
- Microwaves
- Earth Atmosphere
- Satellite Orbits
- ...

- **Water vapor calculation**

With data collected from the projects antenna



Motivating Videos for students



In four languages



www.tryat.eu

STARTER KIT 1.0

ARDUINO MEGA 2560

The MEGA 2560 is designed for more complex projects. With 54 digital I/O pins, 16 analog inputs

DS18B20 (Temperature) [2x]

Digital thermometer

Measures Temperatures from -55°C to $+125^{\circ}\text{C}$

NEO6MV2 (GPS Module)

50 Channels

GPS L1 frequency, C/A Code

SBAS: WAAS, EGNOS, MSAS

BME280 (Temperature, Pressure, Humidity)

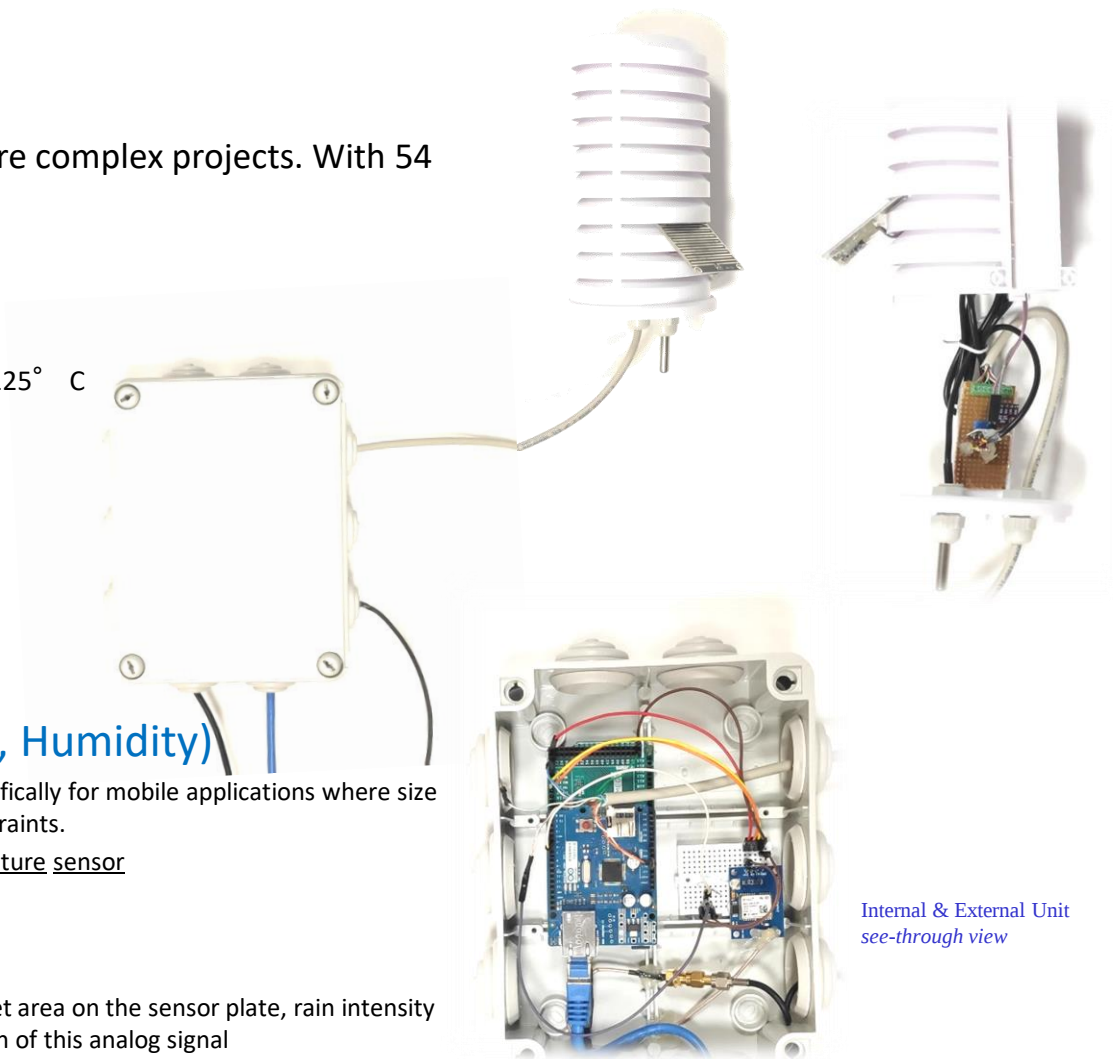
Integrated environmental sensor developed specifically for mobile applications where size and low power consumption are key design constraints.

Combined digital humidity, pressure and temperature sensor

based on proven sensing principles

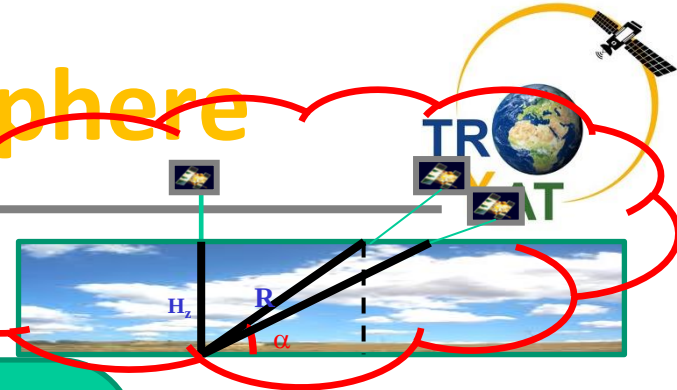
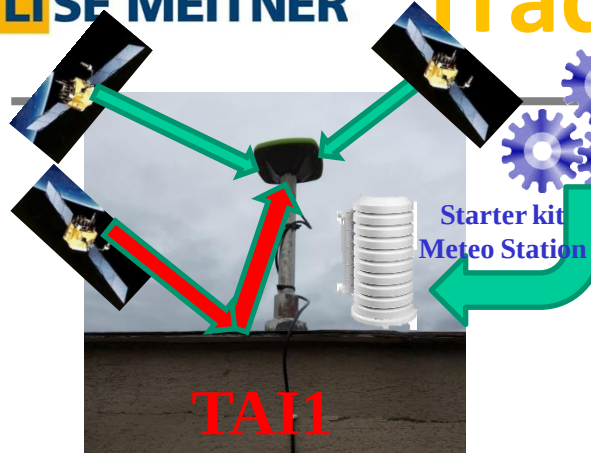
YL-38 (with a FC-37 Rain sensor)

The signal is proportional to the percentage of wet area on the sensor plate, rain intensity has a direct impact on the amplitude and variation of this analog signal

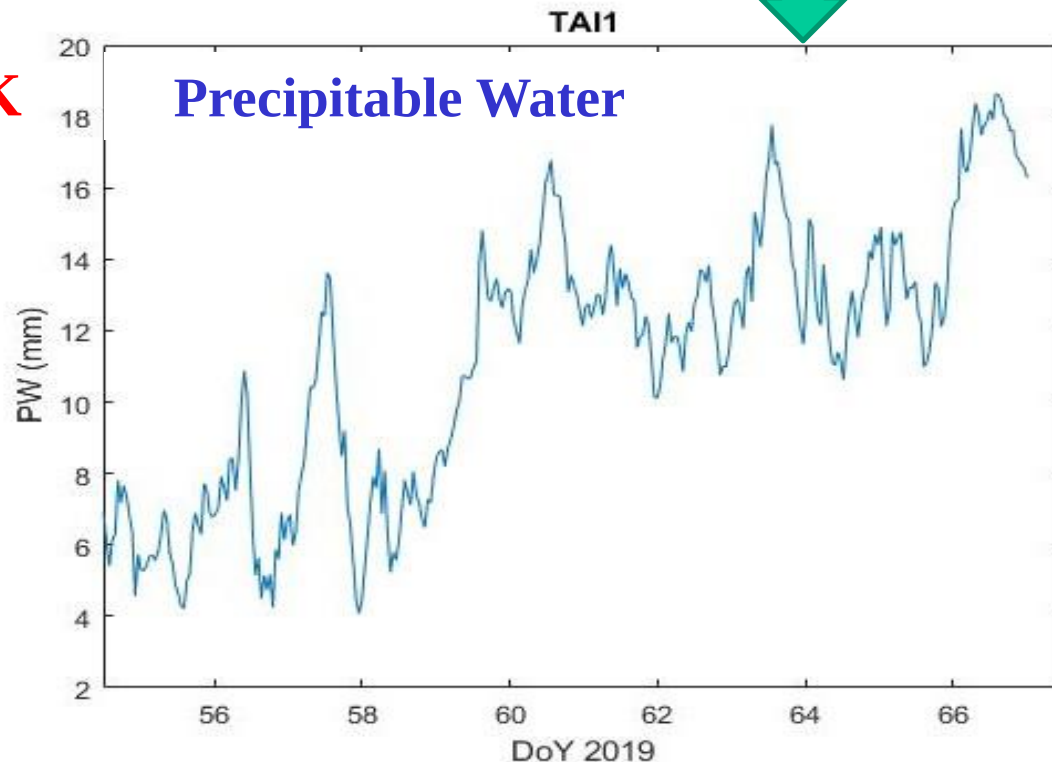
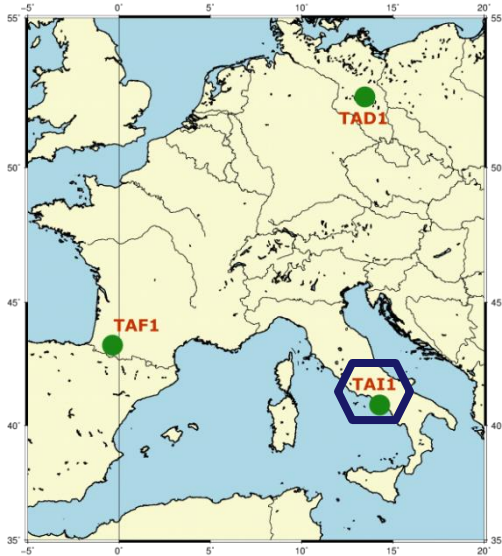


Internal & External Unit
see-through view

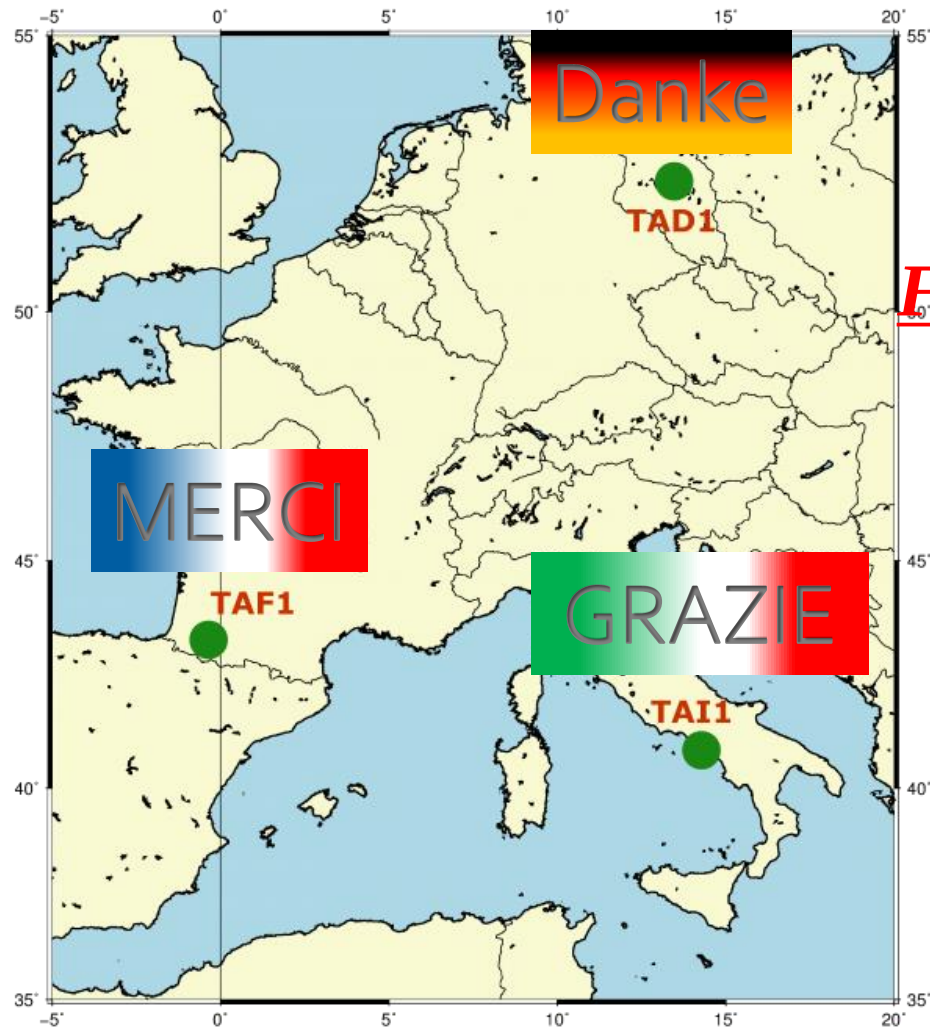
Track your atmosphere



TRYAT NETWORK



Track your atmosphere



For further details, please visit:

<https://www.tryat.eu/>

