

Monitoring of turbulent convection and dispersion in the Sterzing mountain valley

using a cluster of Lagrangian radiosondes during the TEAMx field campaign

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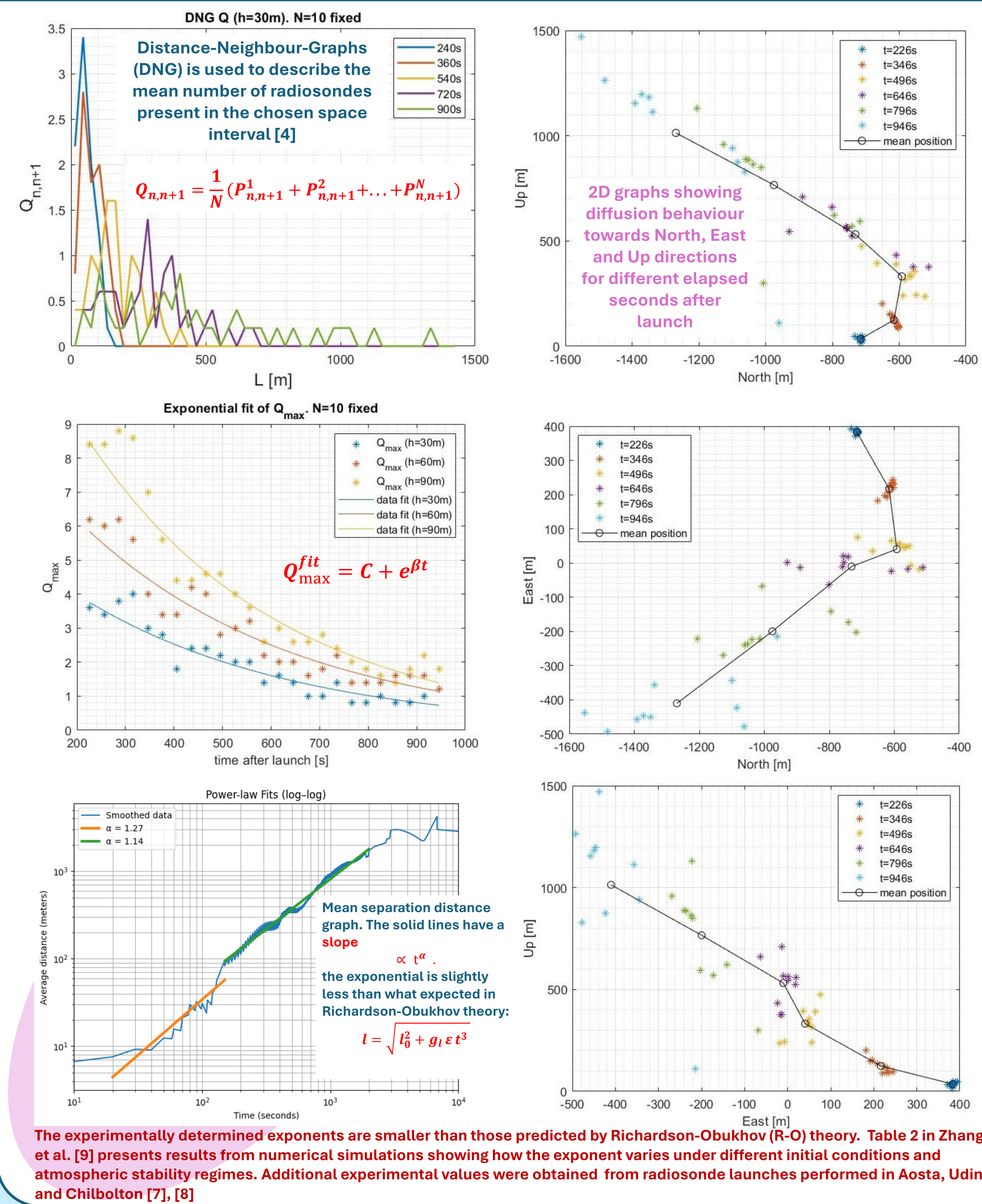
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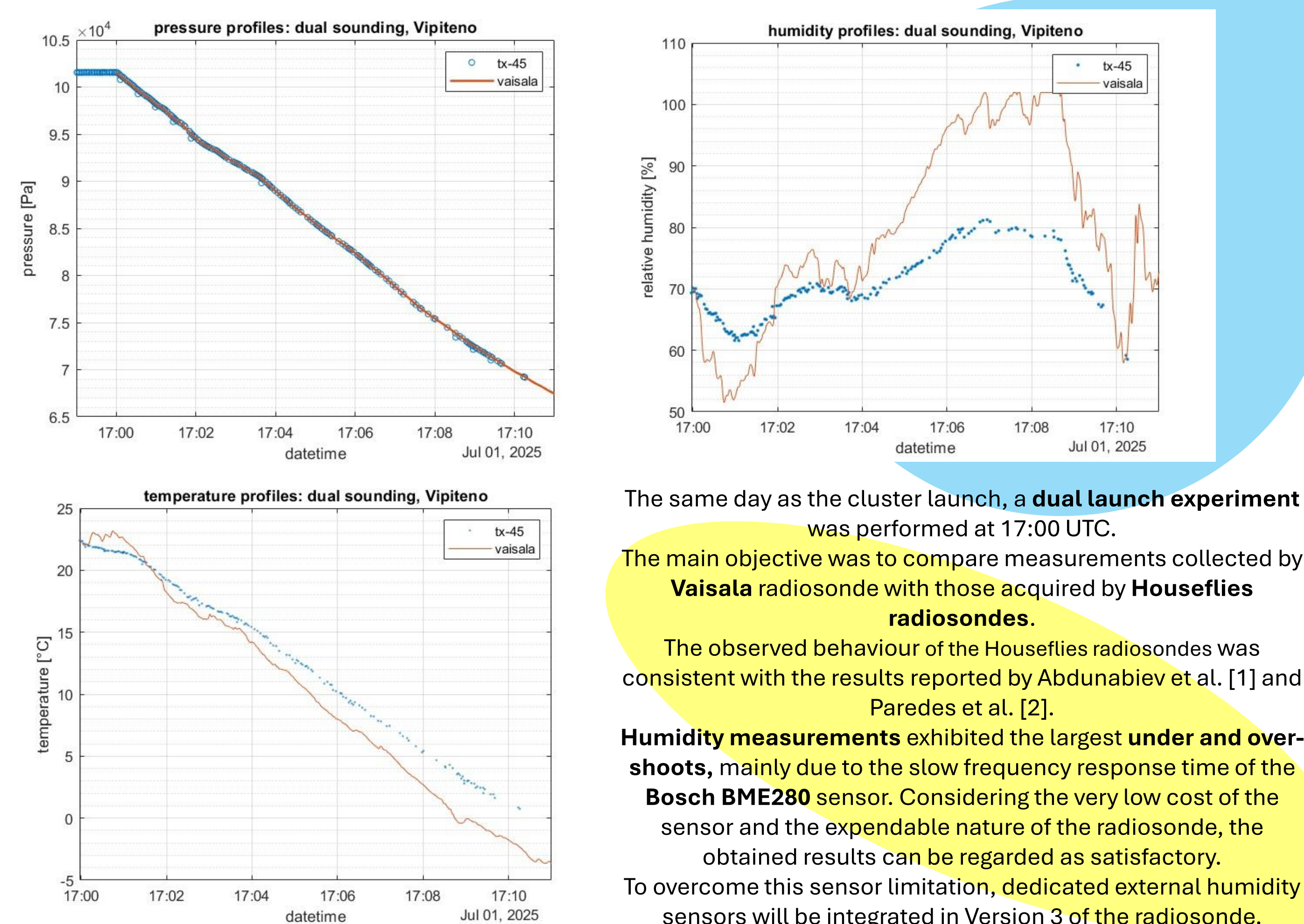
1. Research context and motivation

- Atmospheric **transport** and **mixing** over **mountainous terrain** are strongly influenced by turbulence, convection and complex orography
- Tracking **turbulence dynamics**: Lagrangian fluctuation, entrainment, dispersion, diffusion, transport and decay
- Investigating **clouds features in ABL**, as they are one of the main sources of uncertainties in **weather predictions** and **climate sciences**
- Analysing the wide **range of scales** of physical and chemical processes inside ABL

3. Tracking turbulent dispersion



5. Dual launch: profiles comparisons



References

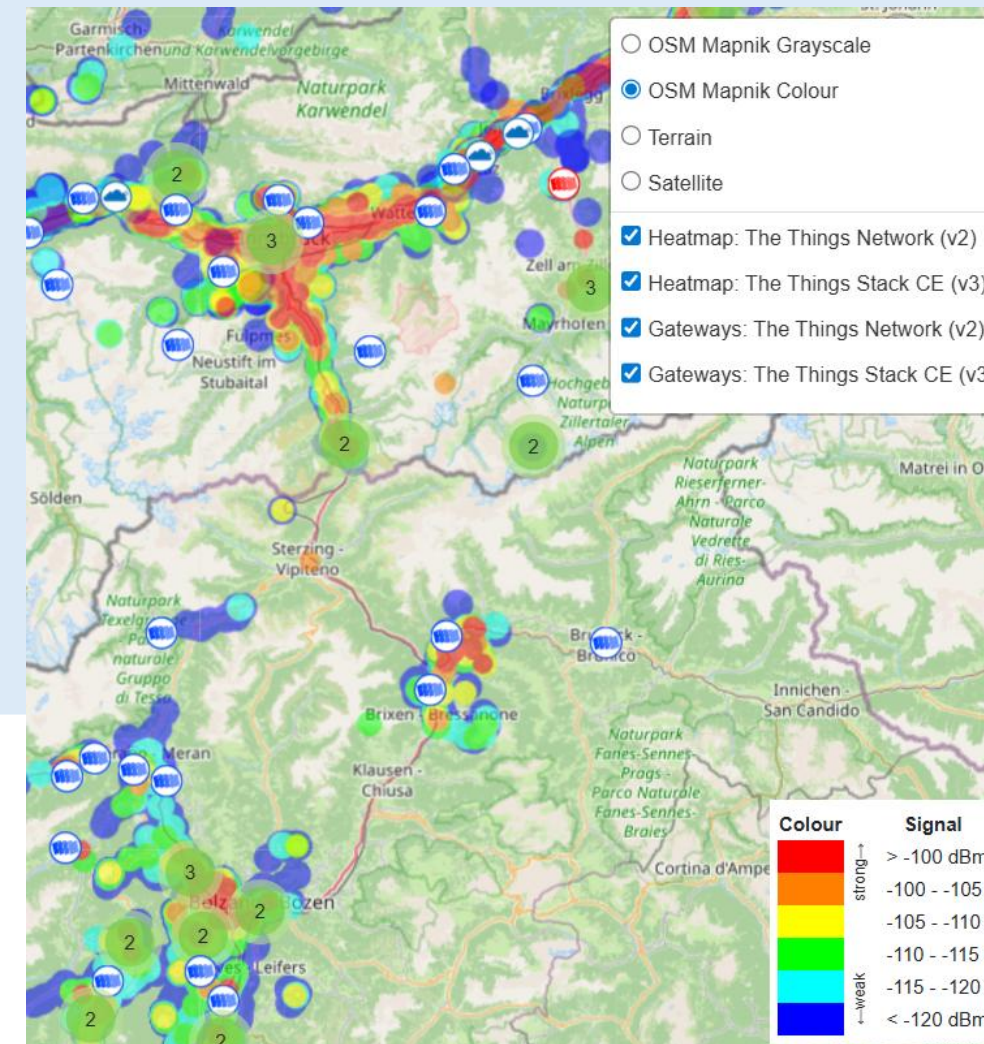
- [1] Abdunabiev S. et al., Measurement 224, 113879 (2024)
[2] Paredes et al., Sensors 21, 1351 (2021)
[3] Basso et al., Mat. Chem. Phys. 253, 123411 (2020)
[4] Lewis Fry Richardson. Atmospheric diffusion shown on a distance neighbour graph. (1926)
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[6] Zängl et al. (2015), ICON modelling framework
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2. In field Lagrangian observations

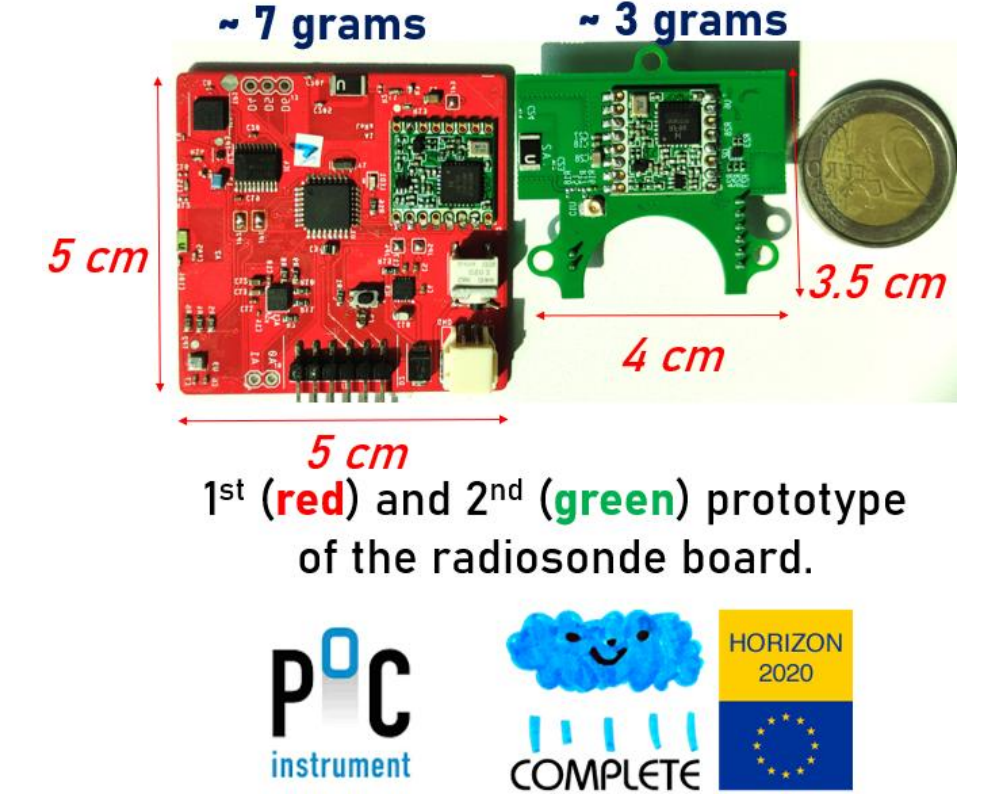
Sterzing, Trentino-Alto Adige, July 2025 [5]



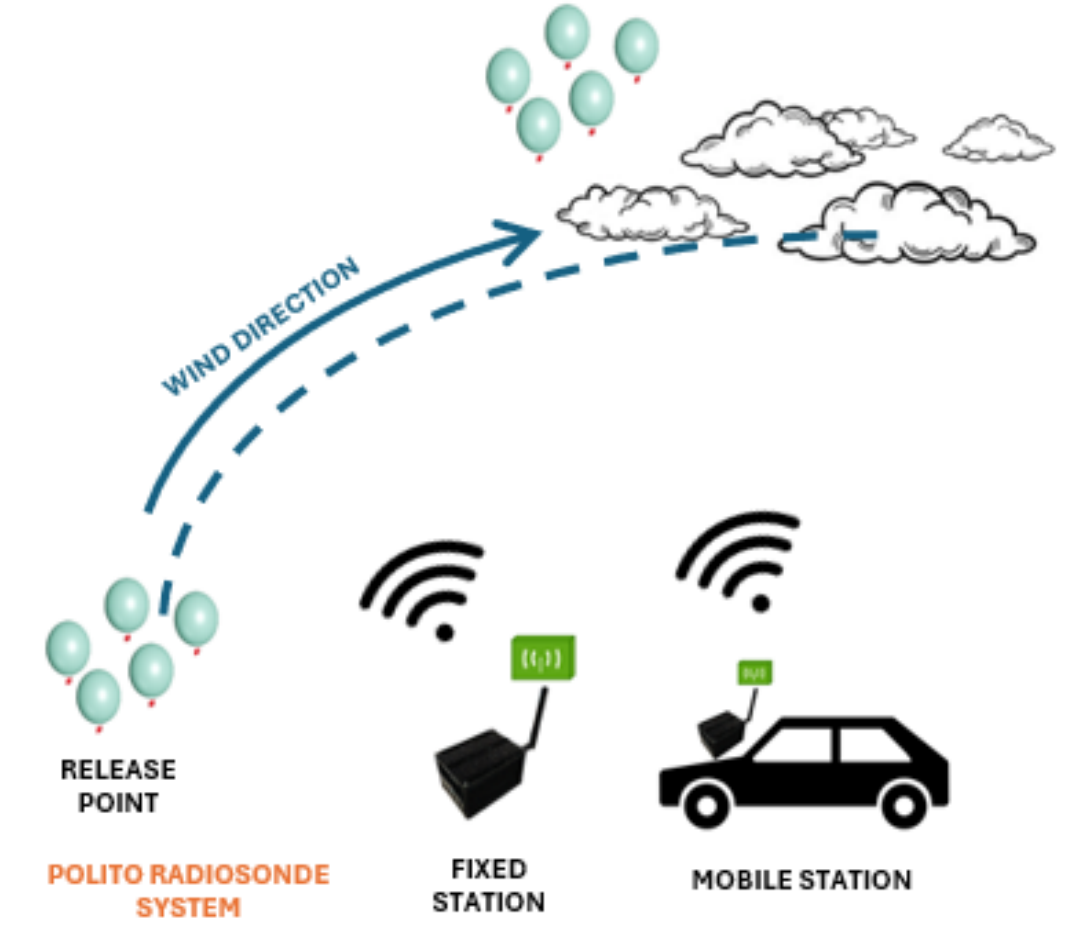
TTN coverage around Vipiteno/Sterzing



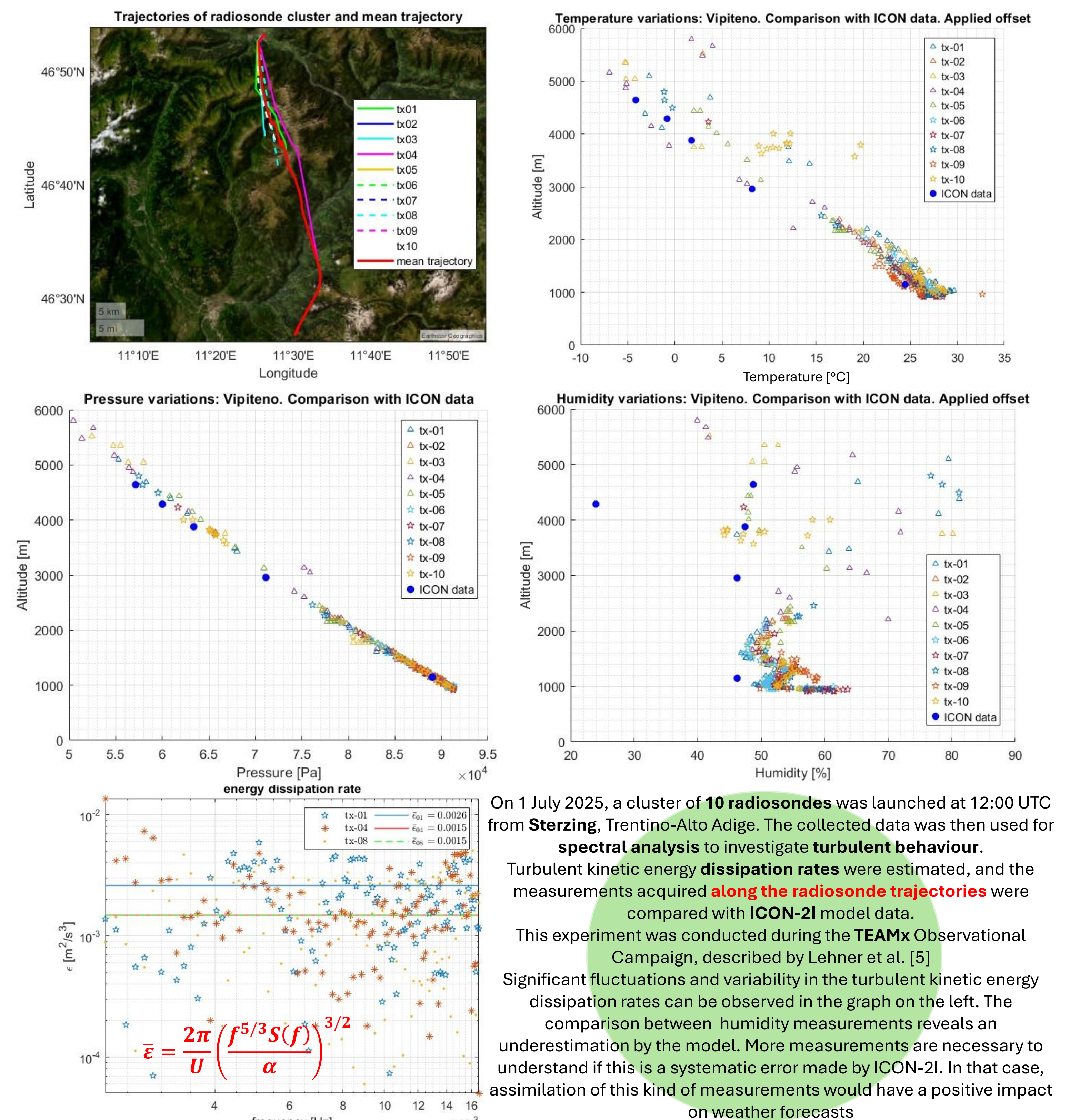
Radiosonde design



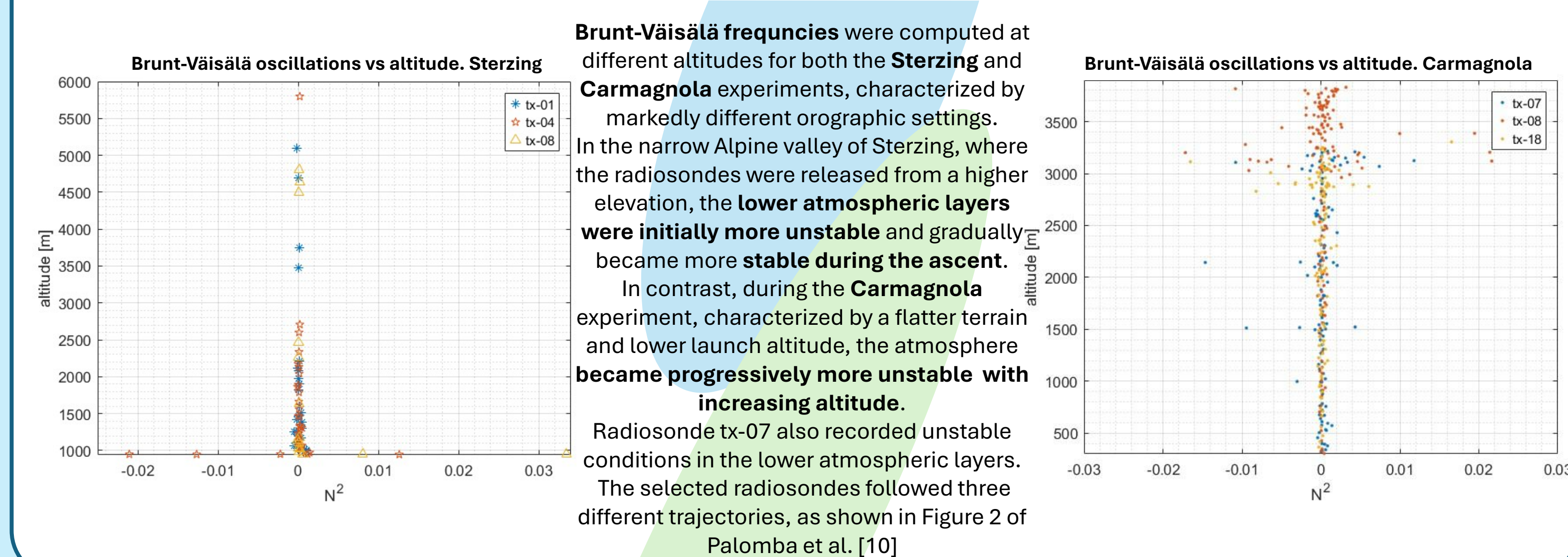
LoRa P2P based
Wireless Sensor Network



4. Cluster experiment results and comparison with ICON-2I data



6. Tracking air layers stability in narrow and wide valleys



Interested in this work? We would be glad to discuss the project and answer any question!

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