A business case for wind resource assessment using scanning wind lidars

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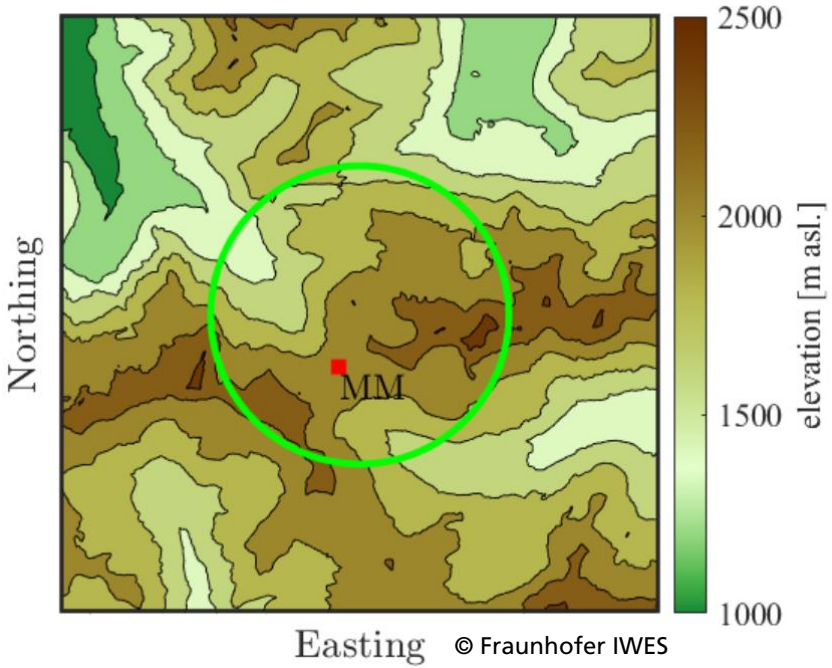
Resource assessment at the Austrian Alps… what would you do?

- 2 met masts?
- 1 or 2 met masts and a profiling lidar?
- 3 met masts?
- OR… another solution?



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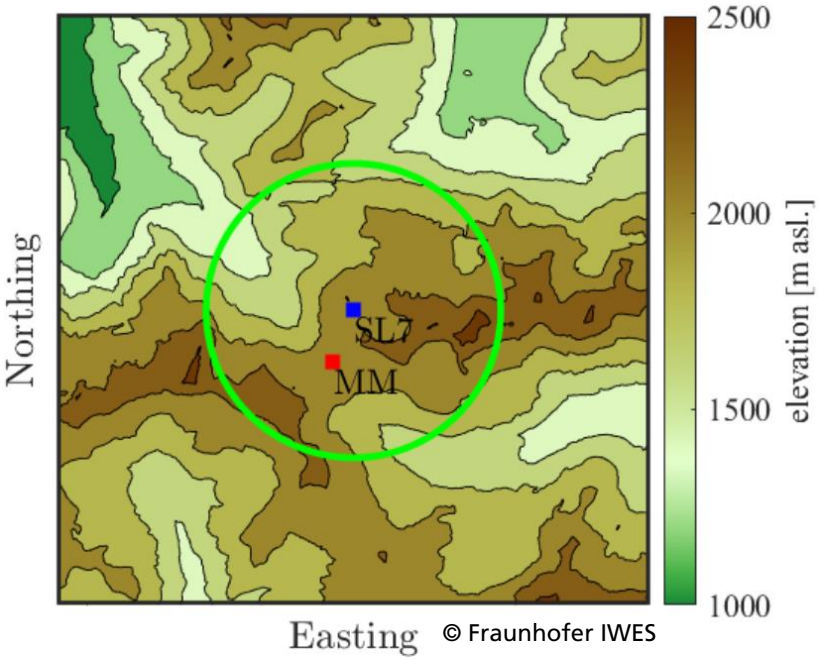
What we've done

- Methodology to reduce numerical modeling uncertainty in resource assessment using one **scanning lidar** [1]



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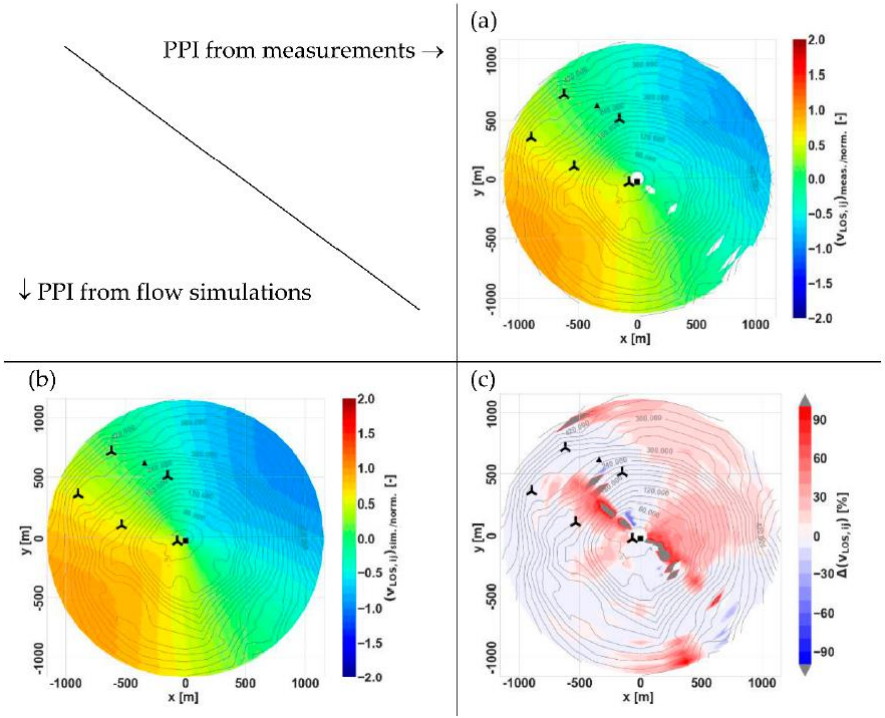
[1] J. Gottschall et al.: Advancing wind resource assessment in complex terrain with scanning lidar measurements (2021). In *Energies*. DOI: 10.3390/en14113280

The methodology and example case study

1. Process 1-min PPI scans to 30-min ensemble means and cluster the data in a capture matrix.
2. Project numerical model output (3D wind field) onto single scanning lidar beams
3. Normalize observed and simulated radial wind speed fields
4. Map of differences between observations and simulations as basis for numerical model calibration

Milestones

- Demonstration campaign published in [1]
- First commercial campaign in 2021 (Windsfeld project)



[1] J. Gottschall et al.: Advancing wind resource assessment in complex terrain with scanning lidar measurements (2021). In *Energies*

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Takeaways

- Fraunhofer IWES/GEO-NET proposed a methodology for assessing numerical modeling biases using scanning lidars
- First commercial scanning lidar campaign for resource assessment in complex terrain carried out in 2021
- Results can reduce AEP uncertainty via numerical model calibration and optimization of wind farm layout

Questions? More details?

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