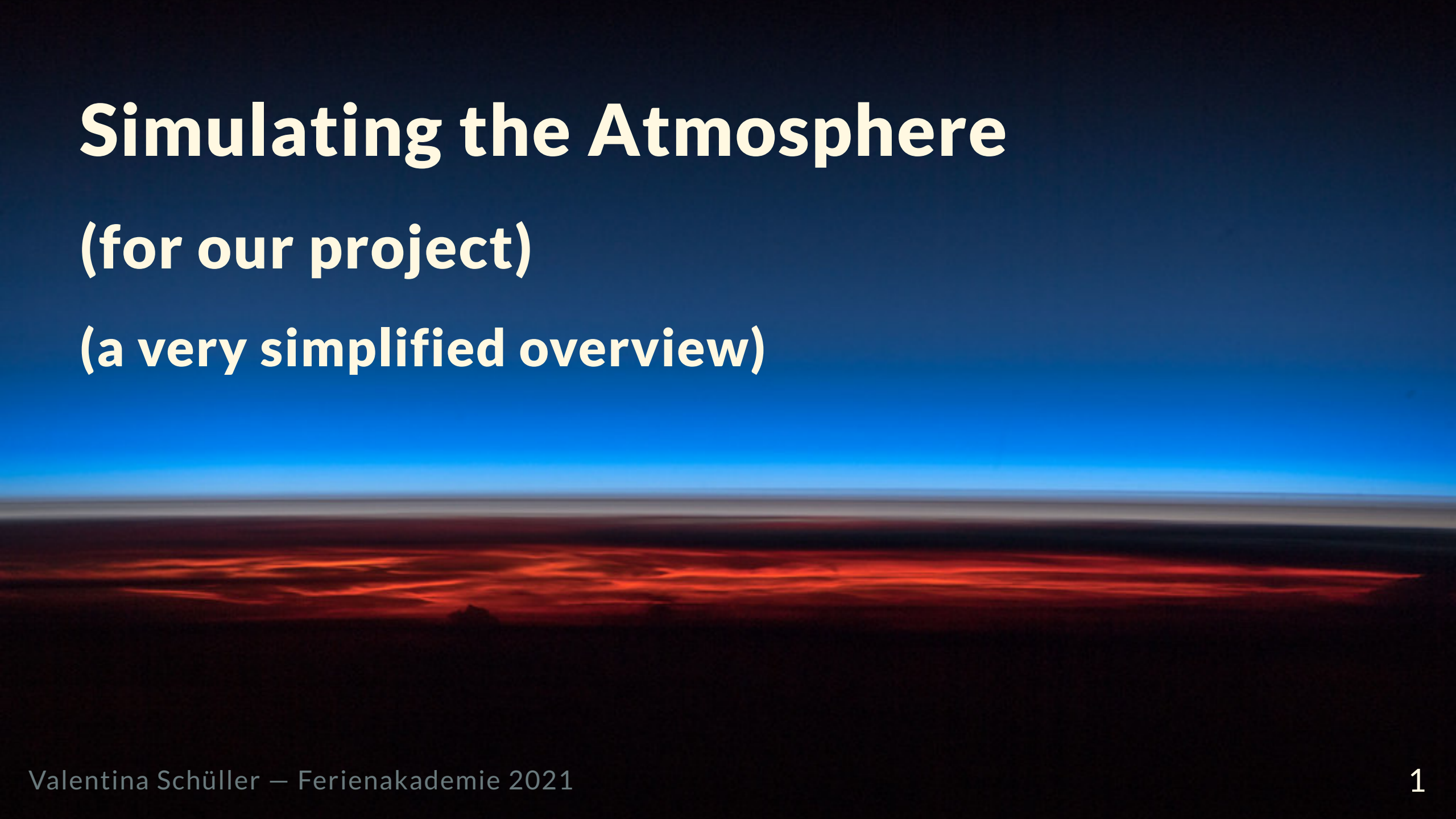
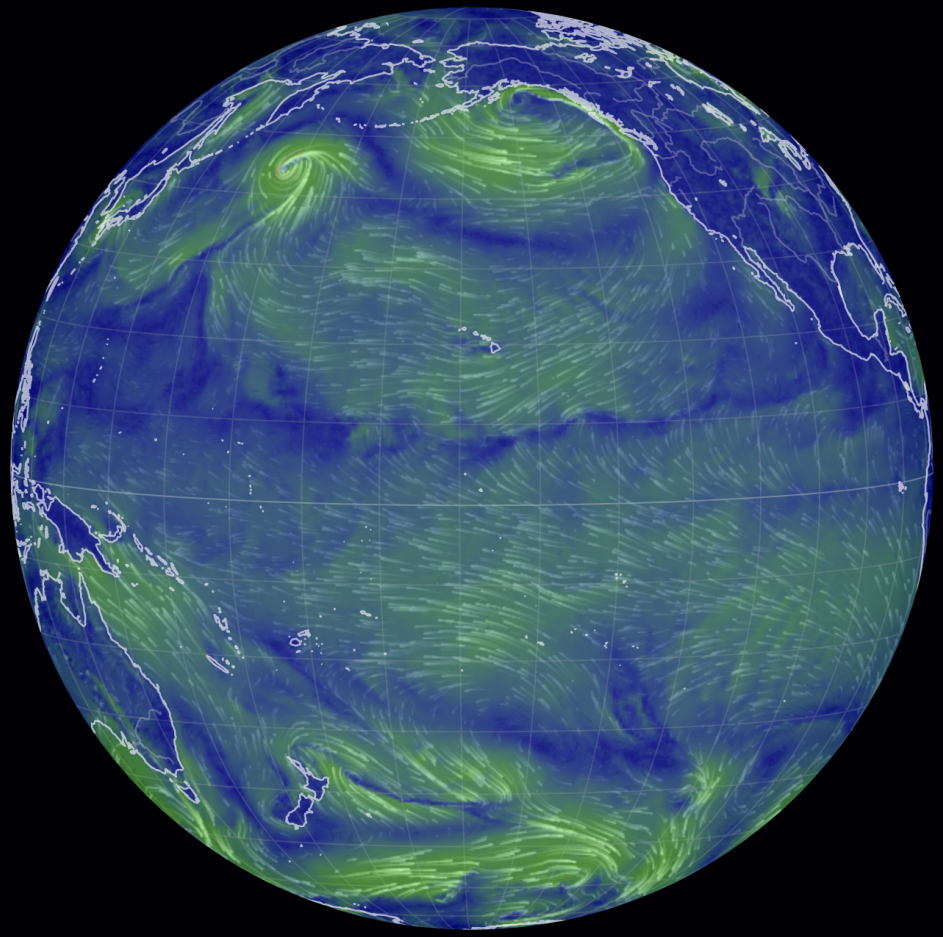


Simulating the Atmosphere

(for our project)

(a very simplified overview)

What can we expect (not) to see?

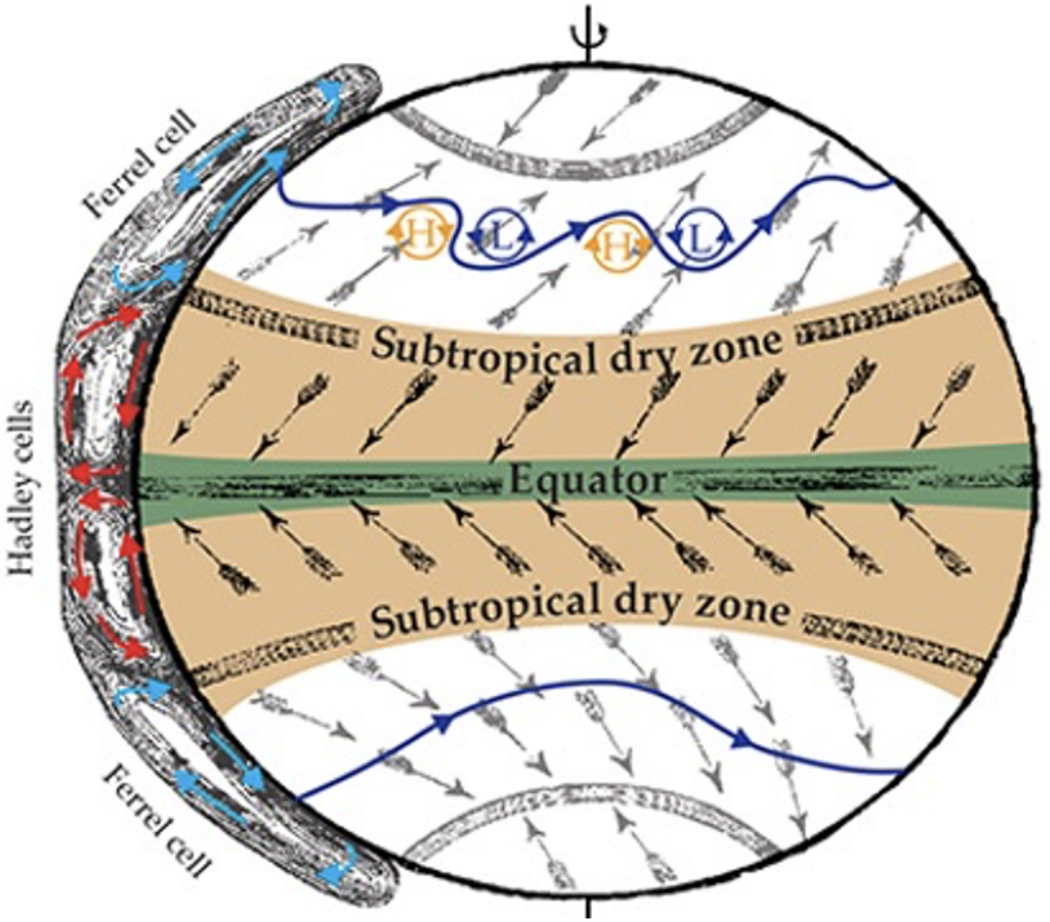


Possible:

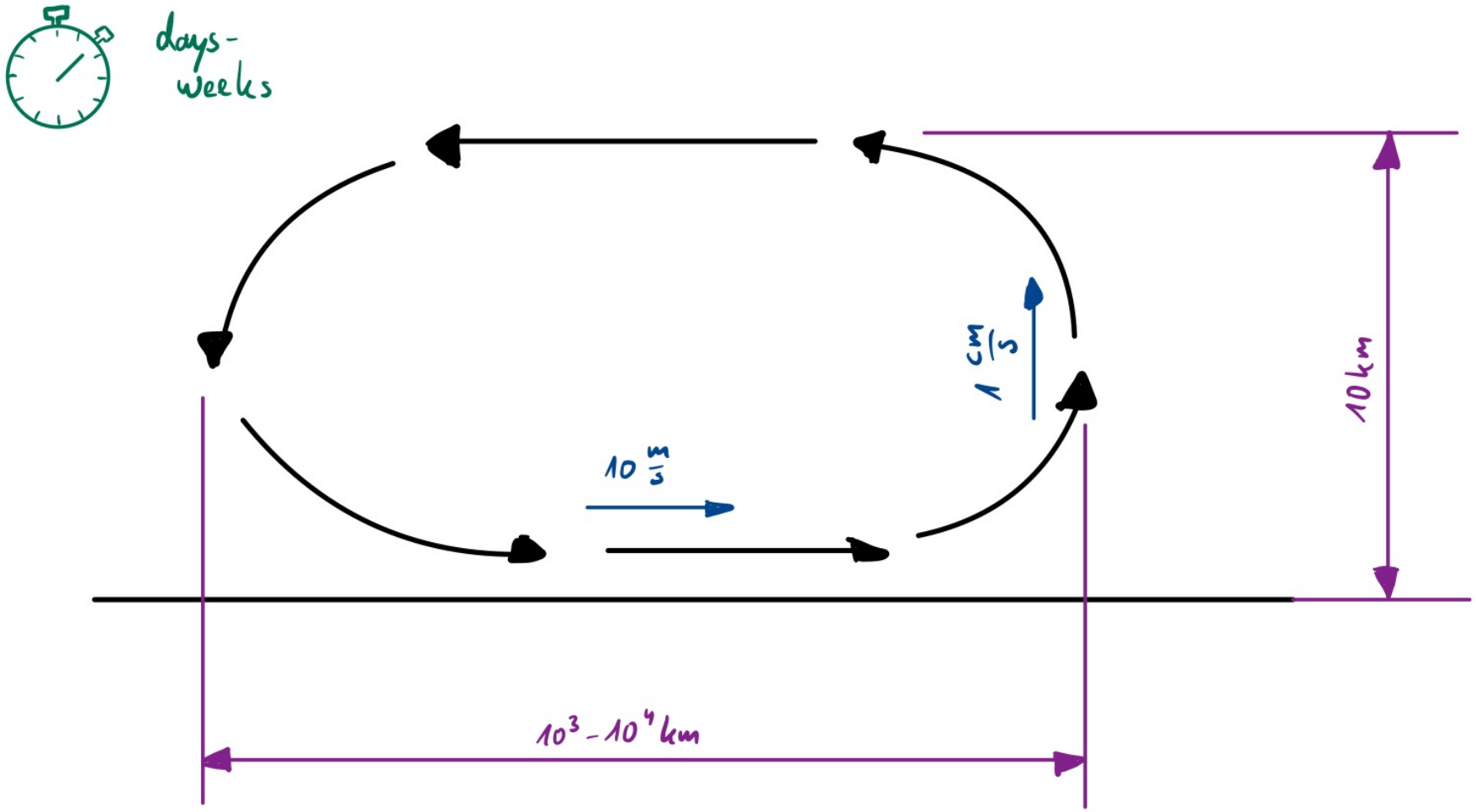
- meridional overturning circulation (Hadley / Ferrel)
- some form of water evaporation / rainfall

Not Possible:

- zonal circulation (e.g., jet streams)
- eddies (Rossby waves)



A Matter of Scales



Modeling Assumptions

- "pizza model" $\leftrightarrow$ axi-symmetric model $\Rightarrow$ no day/night effects
- spherical coordinates
- neglect land/water surface height
- neglect effects of water content on dynamics and radiation
- treat solar radiation as ??
- ground can be land or water

Model Equations

Discretization Suggestions

Finite Differences in space & time

Implementation Considerations I

Implementation Considerations II

Literature / References

Image Credits

1: "Atmosphere | Atmosphäre" by Astro_Alex is licensed with CC BY-SA 2.0. License Copy.

2: Screenshot from https://earth.nullschool.net/. (2021-09-17, 10:57)

3: Adapted from Fig. 2 in: Birner, Davis, Seidel: Physics Today 67, 38-44 (2014). DOI: 10.1063/PT.3.2620.