

PROPOSAL

Application of Machine Learning in Predicting Gaseous Properties of Earth Atmosphere

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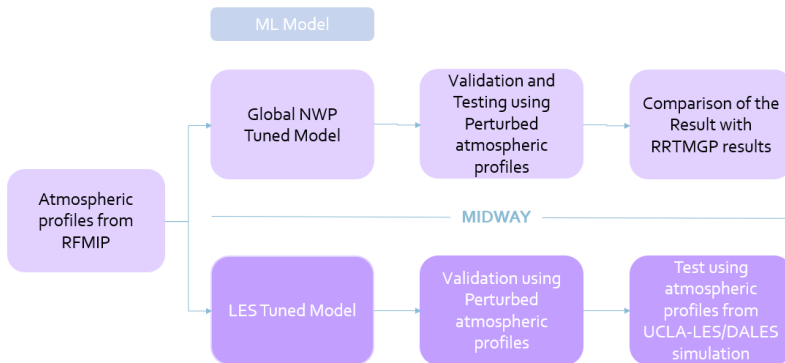
Objective: To accelerate the data-driven aspect of the calculation of optical properties from temperature, pressure and gaseous concentration of the atmosphere using neural networks.

DataSet: Atmospheric profiles from RFMIP (Radiative Forcing Intercomparison Project)

- References:**
- ▶ Veerman, Menno A., et al. "Predicting atmospheric optical properties for radiative transfer computations using neural networks." *Philosophical Transactions of the Royal Society A* 379.2194 (2021): 20200095.
 - ▶ Ukkonen, Peter. "Exploring pathways to more accurate machine learning emulation of atmospheric radiative transfer." *Journal of Advances in Modeling Earth Systems* 14.4 (2022): e2021MS002875.
 - ▶ Ukkonen, Peter, et al. "Accelerating radiation computations for dynamical models with targeted machine learning and code optimization." *Journal of Advances in Modeling Earth Systems* 12.12 (2020): e2020MS002226.

- Work Division:**
- ▶ Anna-Slide Preparation, Report Writing, Programming, Data Processing
 - ▶ Sumegha-Slide Preparation, Report Writing, Gathering Data, Programming

WorkFlow



- ▶ NWP-Numerical Weather Prediction
- ▶ LES-Large Eddy Simulation
- ▶ DALES-Dutch Atmospheric Large Eddy Simulation
- ▶ RRTMGP-Rapid Radiative Transfer Model Parametrization