Unified Model of Forecasting Ozone

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Abstract

The chemical transport models face challenges in simulating the concentrations of surface ozone accurately in all conditions when meteorology and chemical environment are changing. The capability of capturing the principle physical and chemical processes is clearly limited. We propose a unified framework based on deep learning to provide a more accurate prediction of surface ozone. The model is tailored to individual observation sites in China, forming a specific graph that would reflect the interaction between spatial and temporal connection in physics and chemistry. This mitigates the uncertainty associated with model resolution and emissions. We show that the model achieves the State-of-the-Art (SOTA) performance in simulating MDA8 ozone. The model structure is also flexible to be applied to other places where observations are available such as Europe and North America. This work underscores great benefits that can be gained through implementing more measurement sites to enhance the density of the model graph.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

TOAR: Tropospheric Ozone Assessment Report, CCMi: Chemistry Climate Model Initiative

IGAC Regional Working Groups

China Working Group