

Seminar “Ocean, Ice and Atmosphere”,
Institute of Environmental Physics (IUP), Univ. Bremen
Date: 7-May-2024, 12:15
Place: Building GW2, Room B2890

NitroNet - A deep-learning based NO₂ profile retrieval prototype for the TROPOMI satellite instrument

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Nitrogen dioxide (NO₂) is an important air pollutant and contributes to urban smog. There exist different methods of measuring NO₂ in the atmosphere: Satellite instruments (e.g. TROPOMI), in-situ measurements at the surface, and ground-based spectroscopic measurements (e.g. MAX-DOAS). In this talk, the limitations of these measurements are discussed and used as motivation to introduce a new type of machine-learning model („NitroNet“). NitroNet combines information from satellite measurements, atmospheric observations, and regional chemistry and transport models in order to predict NO₂ profiles of the troposphere. Possible applications of this new approach with respect to air quality modeling and improvements to existing satellite retrievals are showcased. The proposed method can further be applied to other fields of environmental science.