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To all members of the
Faculty of Physics

Vienna, 06 May 2025

Invitation to the public defense of the doctoral thesis

**“Airborne observations of aerosol optical properties of
mineral dust mixtures in the eastern Mediterranean”**

by

Marilena Teri

Tuesday, 13 May 2025, 13:00 p.m.

Ludwig-Boltzmann-Lecture Hall, ground floor, Boltzmannngasse 5, 1090 Vienna

Mineral dust particles, emitted into the atmosphere from wind acting on deserts, are abundant worldwide, forming layers that can be transported long distances and can mix with anthropogenic aerosols. The optical and radiative properties of these mixed aerosol layers can differ from those of the pure aerosol plums. This thesis focuses on improving the understanding of the optical and radiative properties of mineral dust and its mixtures using in situ measurements of aerosol optical properties. Through laboratory experiments, model simulations, and airborne observations, it (1) evaluates uncertainties of direct in situ measurements of the particle scattering coefficient of mineral dust, (2) establishes guidelines for its determination depending on the aerosol type and size range, (3) systematically investigates the intensive optical properties of mixtures of mineral dust from two source regions and pollution, (4) examines how well mineral dust events can be identified in polluted conditions using intensive aerosol optical properties, and (5) assesses the change in the direct radiative effect efficiency of mineral dust layers for increasing pollution.

Defense committee:

Andreas Petzold, Forschungszentrum Jülich GmbH, DE (reviewer)

Martin Gysel Beer, Paul Scherrer Institute PSI, CH (reviewer)

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