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The development of a detailed mineralogical database from satellite remote sensing products, towards an improved representation of dust transport in NWP simulations.

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A broad spectrum of environmental processes such as radiation, cloud formation, ocean fertilization and human health are affected from the presence of mineral dust. The transport of dust particles is dictated by the prevailing meteorological conditions as well as the composition and physiochemical properties of the particles themselves. Which, in turn, are bound to the soil mineralogy at the source region.

Numerical weather prediction models can estimate the transport of dust particles, yet a more refined mineralogical categorization can significantly improve the dust transport estimations and increase preparedness for implications on weather, biogeochemistry and health. This novel mineralogical representation is derived from multi-spectral satellite remote sensing sensors (Sentinel 2A) over a limited area around Lake Chad in Sahara desert by taking into account dust particle characteristics such as size, composition and optical properties. The mineralogy map will be implemented in WRF/CHEM model to improve the accuracy of atmospheric simulations. The final product will be juxtaposed against current state-of-the-art mineralogical products such as the NASA's Earth Surface Mineral Dust Source Investigation (EMIT) mission. Dust transport simulations will be compared against field measurements from Antikythera PANGEA station in the Mediterranean and ASKOS campaign in the Atlantic Ocean.