The Impact of Saharan Dust on the North Atlantic Circulation

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GRIN Verlag Mrz 2010, 2010. Taschenbuch. Book Condition: Neu. 296x210x8 mm. This item is printed on demand - Print on Demand Neuware - Doctoral Thesis / Dissertation from the year 2010 in the subject Geography / Earth Science - Meteorology, Aeronomy, Climatology, grade: Sehr Gut, University of Hamburg (Institute of Oceanography), language: English, abstract: The erosion of Saharan soil is the World's largest annual source of mineral dust aerosols, resulting in a deposition of more than 40% of the global atmospheric dust into the North Atlantic (NA). By changing the atmospheric opacity, mineral dust can alter the shortwave radiative forcing at the surface of the ocean, altering the ocean mixed layer heat budget and therefore affecting the sea surface temperature (SST). Moreover, changes of the total amount of energy received at the ocean surface have an impact on the ocean circulation. In this thesis we combine several satellite observations, in-situ radiation measurements, a 1D mixed layer model of the ocean, and various versions of a 3D general ocean circulation model, to study the impact of Saharan dust on the circulation of the NA. A buoyancy source generated by realistic dust-induced shortwave flux anomalies is imposed in the eastern NA and...

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