



Ship-borne UV and ozone measurements in the

S. Wuttke, S. El Naggar, O. Schrems

Alfred Wegener Institute for Polar and Marine Research (Contact: Sigrid.Wuttke@awi.de)

Ship-borne measurements of spectral as well as biologically effective UV irradiance have been performed aboard the German research vessel Polarstern during an Atlantic transect from Bremerhaven (Germany) to Cape Town (South Africa) from 13 October to 17 November 2005. Such measurements are necessary to validate satellite-derived surface UV irradiances but also to study the effects of UV radiation on marine organisms. Parameters having an effect on the UV irradiance at the surface, such as total ozone column, vertical ozone distribution and aerosol optical depth have been measured simultaneously. The data have been used as input in a radiative transfer model to quantify their effect on UV irradiance facilitating an assessment of UV radiation in a marine environment in various climate zones. These cloud free radiative transfer calculations support the investigation of this latitudinal dependence. The maximum daily dose of erythemal irradiance of 5420 Jm^{-2} was observed in the Tropical Atlantic south of the equator. It should have been observed a few days earlier with the Sun in the zenith during local noon. Then, stratiform clouds reduced the dose to 3835 Jm^{-2} . In comparison, the daily erythemal doses in the mid-latitude Bay of Biscay reached only values between 410 and 980 Jm^{-2} depending on cloud conditions.