

Future projections of surface UV-B in a changing climate

Shingo Watanabe[†];

[†] JAMSTEC, Japan

Leading author: wnabe@jamstec.go.jp

Results of comprehensive long-term simulations of surface all-sky and clear-sky ultraviolet (UV) radiation through 1960-2100 are presented. A new earth system model, MIROC-ESM-CHEM, is used for the simulation, which considers key processes that change the surface UV radiation: atmospheric dynamics and chemistry affecting ozone in the stratosphere and troposphere, aerosols and clouds in the troposphere, and changes in surface albedo with sea-ice and snow cover. In contrast to previous assessments considering only the effect of long-term change in stratospheric ozone, the simulated long-term behavior of UV radiation in this study is strongly affected by other processes. In one of two simulations, all-sky UV radiation in the northern mid-latitudes is projected to increase in the 21st century despite the generally anticipated recovery of the stratospheric ozone layer. Reductions in aerosols and clouds are expected to overcompensate for the effect of ozone recovery. The results are sensitive to the future socio-economic scenario, describing GHG concentrations and emissions of aerosol and ozone precursors in the troposphere.