



## **Global radiation maps and their modulation by clouds. - An assessment of limitations and deficiencies in global modelling**

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Satellite sensed solar and infrared broadband radiation maps at the top of the atmosphere (ToA) usually serve as reference and constraints to global modelling. Complimentary radiation maps at the surface are less certain, as they require accurate knowledge about atmospheric and environmental properties. Despite differences among multi-decadal data-projects of ISCCP, the SRB and the CERES, their diversity is small in comparison to efforts in global modelling. Based on simulations for the IPCC fourth assessment, clear biases on a regional and seasonal basis are identified and illustrate deficiencies in the representation of clouds. These deficiencies are explored in the context of available cloud data from passive and active remote sensing from space.