Measurements and modelling of the duration of the safe sunbathing during the Baltic Sea coast campaign in 2015 – comparison of methods.

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Information of intensity of surface UV radiation to the public is given in terms of UV Index, i.e. the daily maximum of the erythemally weighted UV irradiance based on a prognostic model. The quality of the UV forecast mostly depends on the accuracy of the total ozone and cloudiness prognosis. Thus, it seems possible that the observed UV index is sometimes far from the 1-day forecasted value especially if the cloud properties are not properly reproduced. Moreover, in some periods of the year (e.g. during summer vacation) we need information of the UV intensity changes throughout the whole day. The UV index value at the noon is not enough to determine risks of the UV overexposure. We present a comparison of various methods to calculate a duration of safe UV exposures (without the erythema risks) during sunbathing at the Baltic Sea coast (Poland) in the period from 13th to 24th July 2015. The UV index at the start of the sunbathing could be determined from the UV measurements by simple hand-held biometer (Solarmeter 6.5) and also could be retrieved (by our smartphone model) from the global forecast of the noon UV index for clear sky conditions. The forecast is freely available for all smartphone users. Including observed cloud cover at the sunbathing site the user could modify the retrieved UV index and obtain the cloud modified value by our smartphone application. Moreover, this application allows selecting the user phototype and atmospheric conditions at the sunbathing site. The best option is to use the UV measurements at the site to determine the duration of the safe sunbathing. However, our smartphone application, which is based on the global clear-sky UV index forecast at noon and user provided simple information about cloudiness over the site, also yields a good agreement with the results derived from the UV measurements.