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Evaluation of precipitation in ERA-Interim reanalysis using observations from the Czech Republic (1982-2016)

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Many studies dealt with evaluation of precipitation characteristics in reanalyses. However, little attention has been paid to ability of reanalyses to reproduce convective and stratiform precipitation, although reanalyses simulate convective and stratiform (large-scale) precipitation separately through cumulus and large-scale precipitation parameterizations in forecasts data. The probable reason is the lack of long-term series of precipitation data disaggregated according to their origin into convective and stratiform. We apply a recently proposed algorithm for disaggregating station precipitation data into predominantly convective and stratiform, and evaluate biases in characteristics of convective and stratiform precipitation (e.g. annual cycle of precipitation amount and the number of wet days, diurnal cycle of convective and stratiform precipitation, and extremes) in an ERA-Interim reanalysis over 1982-2016 in the Czech Republic.
Mean annual cycles of convective and stratiform precipitation amounts are reproduced reasonably well in ERA-Interim. The number of wet days is slightly overestimated for convective precipitation, especially for days with lower precipitation amount, and slightly underestimated for stratiform precipitation. Mean annual maxima of 6-hour and daily precipitation amounts are underestimated in ERA-Interim, especially for convective precipitation, and this underestimation is not only due to spatial smoothing. The daily distributions of convective and stratiform precipitation are studied in all seasons. In summer, when both precipitation components contribute almost equally to the total precipitation amount in the observed data, the peak of convective and stratiform precipitation in ERA-Interim occurs before noon while in observations convective precipitation has its peak in the afternoon and stratiform precipitation at night. Similar behaviour is found in all seasons.