



Long-term Changes in Precipitation Phase in Europe

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The change in precipitation phase is an important manifestation of climate change, especially in the mild climate zone and in mountain regions. It is expected that the proportion of liquid precipitation will increase with rising temperature in these regions. We analyse changes in precipitation phase at ten stations in the Czech Republic and at 148 European stations between November and April. Surface synoptic observations (SYNOP) and temperature and precipitation data are used to describe changes in precipitation phase in the Czech Republic between 1982 and 2006. Daily precipitation amount is categorised as solid/mixed/liquid according to the codes that represent precipitation phase in SYNOP. In general, the analysis shows a decrease (increase) of solid (liquid and mixed) precipitation at most stations. The Czech station data serve for the determination of threshold temperature (T_t), which is then used for the specification of the precipitation phase at European stations in 1961-2004, for which the direct information on the phase is not available. If daily mean temperature is higher than T_t , the daily precipitation amount is considered as liquid and vice versa. The value of T_t is 1.1°C . We find out that the ratio of solid to total precipitation (S/P) significantly declines over large parts of Europe. The strongest trend is detected in the area that begins at the coast of central and south Scandinavia, continues towards central Europe and ends in southeast Europe. The decrease of the average annual S/P ratio is between -0.4% and -0.5% there, the majority of trends being statistically significant. The main reason for the trend in S/P being negative is rising temperature. On the other hand, S/P increases significantly at three stations in northeastern Europe. The average annual trend of S/P is -0.14% for whole Europe.