

Interactive comment on “Exploiting the weekly cycle as observed over Europe to analyse aerosol indirect effects in two climate models” by J. Quaas et al.

J. Quaas et al.

johannes.quaas@zmaw.de

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As suggested by both reviewers, we now modified our analysis to use a shorter time period of 1 January 2000 – 31 December 2006 for the EMEP and 1 April 2001 – 31 December 2006 for the DWD surface observations. This time period is now well comparable to the modelled five-year periods and the satellite records of similar lengths. Fig.1 and Fig. 2 shows the weekly cycle in surface SO₂ and SO₄ concentrations as obtained from the EMEP observations. A relative cycle is shown since absolute values change considerably between the periods. The longer time period 1972 to 2007 is compared to the shorter one 2000 – 2006 (daily data, of 1 January to 31 December for

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each year). For SO₂, a shift towards an earlier minimum is found. This might reflect a shift in habits, with less emissions on Sundays compared to Saturdays in the 1970s and 1980s. For the DWD meteorological data (Fig. 3, 4, and 5), we find that the results are noisier for the shorter time period (particularly for the 2m mean temperature), and that the amplitude is larger. Conclusions about a weekly cycle, though, would be similar for both time periods for maximum 2m temperature and precipitation.

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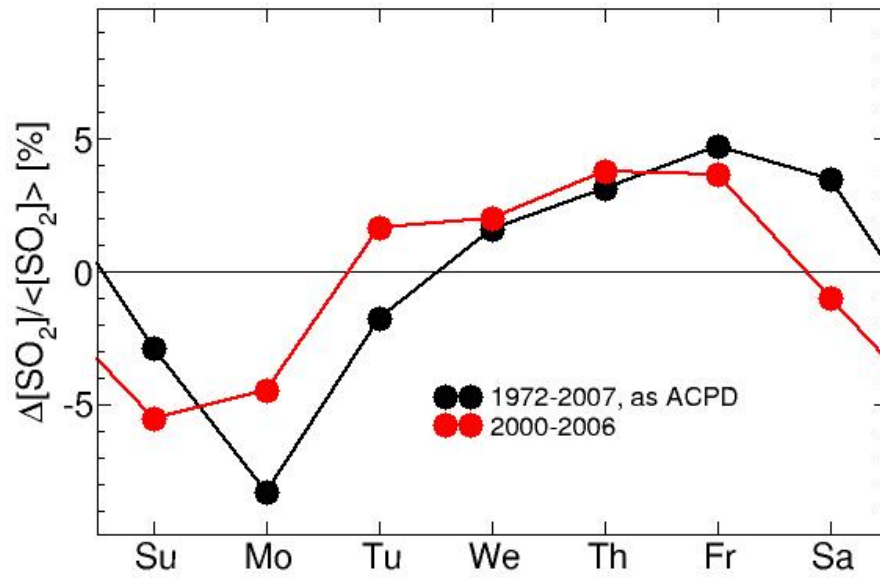


Fig. 1. Relative cycle in surface SO₂ concentrations from the EMEP data (for details see manuscript), when using the entire time period (1972 – 2007, black), when using the shorter period (2000 – 2006, red)

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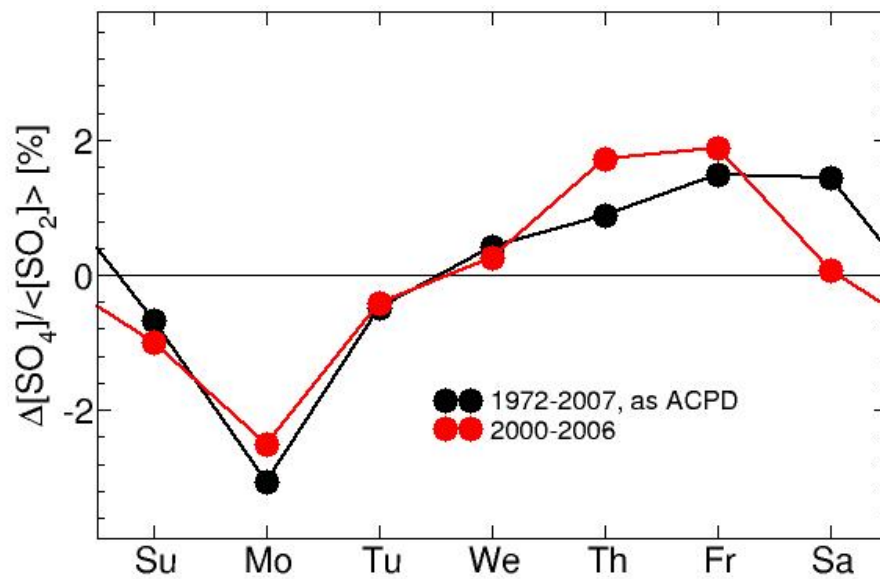


Fig. 2. As Fig. 1, but for the surface SO₄ concentration.

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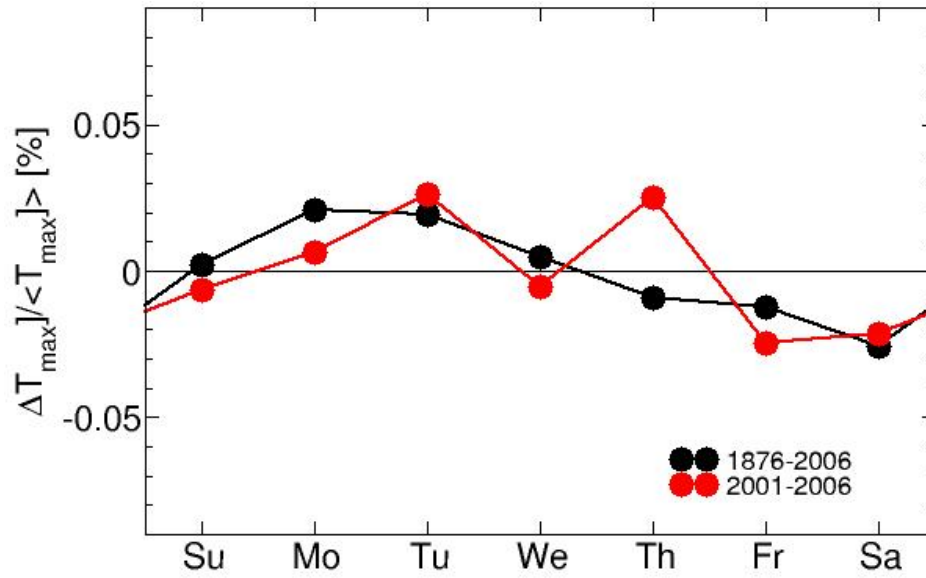


Fig. 3. As Fig. 1, but for DWD data of daily maximum 2m temperature.

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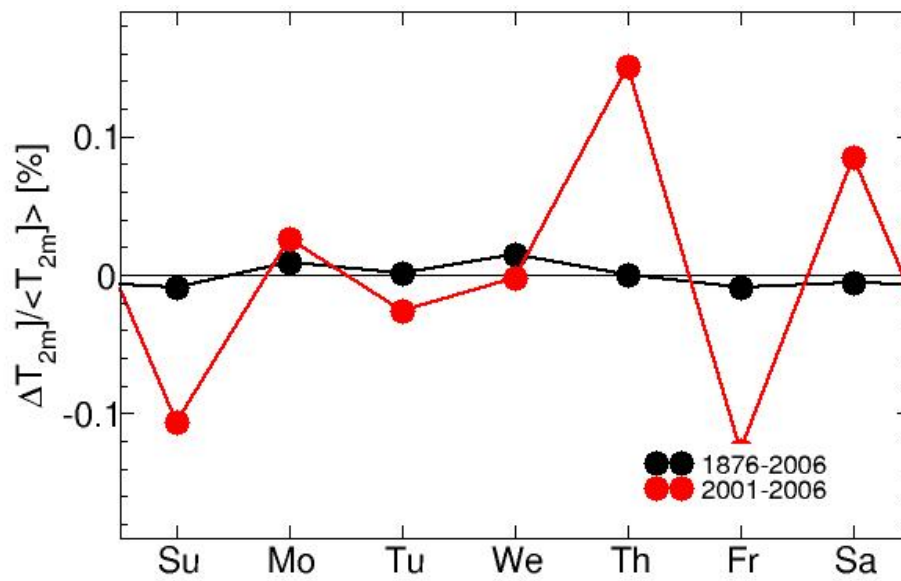


Fig. 4. As Fig. 3, but for daily-mean 2m temperature.

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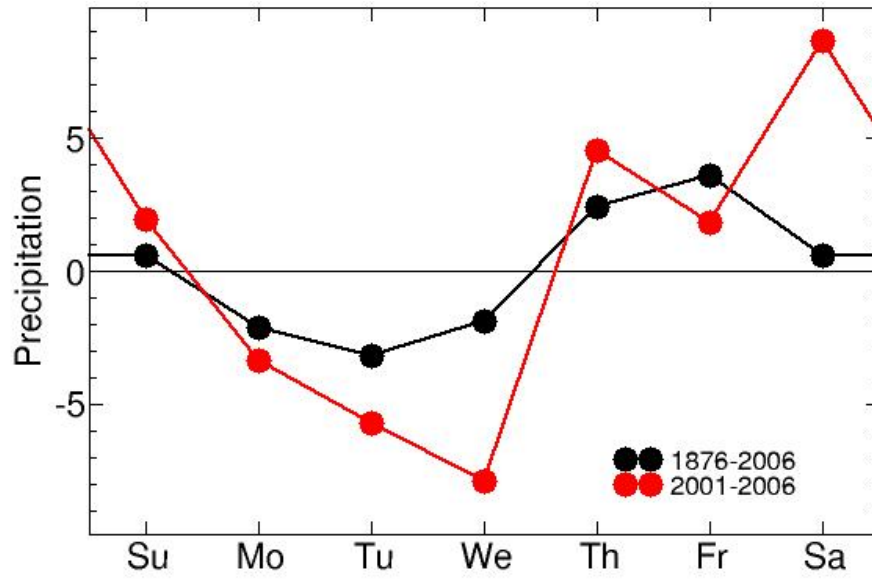


Fig. 5. As Fig. 3, but for 24h accumulated precipitation.