Monthly mean PM10 concentrations in Augsburg (Germany) and their relation to large-scale atmospheric circulation types

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In this contribution the connection between large-scale atmospheric circulation types and local monthly mean PM10 concentrations in Augsburg (Germany) is investigated.

Thereby the focus is put on quantifying the relationships between interannual variations in monthly mean PM10 concentrations during the period 1979 to 2007 and corresponding changes in monthly frequencies of daily circulation types by means of multiple linear regression models.

For deriving daily circulation types on the basis of NCEP/NCAR reanalysis data several variants of automated circulation type classifications (e.g. threshold based methods, optimization algorithms) using varying input variables (e.g. MSLP, 500 hPa geopotential height, . . .) and varying classification settings (e.g. varying size of the spatial domain) are utilized.

The skill of the multiple regression models using occurrence frequencies of circulation types from the different classification approaches as predictor variables is quantified and respective comparisons are carried through in order to find out which classification approach is best suited to capture interannual variations in local PM10 concentrations.