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Temperature sensitivity of a numerical pollen forecast model

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Allergic rhinitis has become a global health problem especially affecting children and adolescence. Timely and reliable warning before an increase of the atmospheric pollen concentration means a substantial support for physicians and allergy suffers. Recently developed numerical pollen forecast models have become means to support the pollen forecast service, which however still require refinement.
One of the problem areas concerns the correct timing of the beginning and end of the flowering period of the species under consideration, which is identical with the period of possible pollen emission. Both are governed essentially by the temperature accumulated before the entry of flowering and during flowering. Phenological models are sensitive to a bias of the temperature. A mean bias of -1°C of the input temperature can shift the entry date of a phenological phase for about a week into the future. A bias of such an order of magnitude is still possible in case of numerical weather forecast models. If the assimilation of additional temperature information (e.g. ground measurements as well as satellite-retrieved air / surface temperature fields) is able to reduce such systematic temperature deviations, the precision of the timing of phenological entry dates might be enhanced.
With a number of sensitivity experiments the effect of a possible temperature bias on the modelled phenology and the pollen concentration in the atmosphere is determined. The actual bias of the ECMWF IFS 2 m temperature will also be calculated and its effect on the numerical pollen forecast procedure presented.