



TEMPERATURE TRENDS IN MESOSPHERE AND STRATOSPHERE AS RELATED TO THE LENGTH OF SUMMER

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Upper mesosphere proxy temperatures (87 km) are derived from hydroxyl emissions at Wuppertal (51° N, 7° E). Strong seasonal variations are observed with minimum temperatures in summer. An Equivalent Summer Duration (ESD) is defined as the time interval when temperatures are below a threshold temperature T_s . A decadal analysis shows that ESD has increased by about 18 days in 20 years.

Temperatures measured at 1 hPa show a maximum in summer, and ESD is defined by the temperatures above a (different) threshold value. ESD at this altitude is found to have decreased in the last 20 years (by 44 days). Lower stratosphere (30 hPa) summer duration can be defined as the time interval between circulation turn-around in spring and autumn. Also these data show a decrease of summer length.

A harmonic analysis suggests that the ESD changes are due (at least in part) to phase changes of the semi-annual oscillation: This phase shows an advance in the recent two decades in the upper mesosphere, and a regression at the stratopause. The change in summer length will be compared to lengthening of the growing season on the ground. The possibility of an anthropogenic effect will be discussed.