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Seasonal variability of the global solar radiation and air temperature in the High Tatras Mountain

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Measurement and registration of the global solar radiation and air temperature are systematic carried out at the meteorological observatories of the Geophysical Institute of the SAS at Skalnaté Pleso (H = 1778 m a.s.l.) and Stará Lesná (H = 810 m a.s.l.). The main task of these observatories is to obtain a valuable meteorological data, necessary for the study of scientific problems in the scope of transfer and transformation of radiative energy, energy balance and deformation of meteorological fields in the complex terrain. Observatories belong to the basic stations for the studies of fluctuations of climate in the High Tatras region.

Hourly values of the global solar radiation and air temperature were used to the analysis and study of the time and vertical variability of these elements in the high-mountain conditions. Different altitudes as well as orographical conditions in the both localities are manifested in the different global solar radiation sums and air temperature conditions. To estimate the global solar radiation changes as well as air temperature the linear approximation of the time series was applied and by the method of the least squares the regression coefficients were calculated. The fluctuations intensity and tendency were determined by the mean of annual sums deviations of the global solar radiation and by the deviations of the mean annual values of the air temperature from the long-term average. To find the trend of secular variations within the period observed, the courses of the global solar radiation and air temperature were smoothed by eleven-year running averages.

Obtained results at Skalnaté Pleso represent the high-mountain conditions and the corresponding values at Stará Lesná may characterize the conditions for forest ecosystems in the Slovak territory. Results of the harmonic analysis application on the pe-

riodic annual courses of the global solar radiation and air temperature have showed that the theoretical curve better fits observed data in case of the air temperature than in case of the global solar radiation.