**Study of the temperatures response to the solar cycle activity for some caves in Bulgaria**

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Cave speleothemes present archive of climate over the last some 10 ky for the region localised. The isotope concentration and micro luminescence bands depend on the temperature and humidity. Direct temperatures measurements were initiated by the Bulgarian federation of speleology before more than 50 years. The measurements were carried out in the cave zone of constant temperature. The results data show three clear cycles responding to the 11 year solar cycles over a time period of 35 years for some karst caves in Bulgaria. The temperature cycles have different lags to the solar cycles. The aim of the work is to found the cave temperature response to the cave environment temperature. For this propose the annual surface temperatures of cities near the caves were analysed. The cave and the city temperature were analysed for a time period of 55 years. The results of the performed temperature Fourier analyses were a surprise. The time series of the surface temperature do not show any solar cycle. For the surface temperature a clear periodic signal of about 7 years was established, probably a response to the North Atlantic Oscillation. Some studies demonstrate that the temperature response to the solar cycle is much greater at higher altitudes. A maximum of the response is observed in a geographic latitude band of 45±15 deg. N and S at an altitude of about 10 km with an amplitude of the mean zonal temperature of 0.1°C to 0.25 °C depending on the used method of investigation. Our hypothesis is that temperature variations caused by the solar cycle are transported to the cave via atmospheric and cave water cycle. Of course a lot of experimental work is needed to confirm or reject the formed hypothesis.