BGP-T2: **Long-term observation of subsurface temperature in drill holes at the Geodynamic Observatory Moxa, Germany**

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Temperature-depth profiles acquired in drill holes reveal temporal fluctuations of the in situ geothermal regime and also how seasonal variations of the surface ground temperature diffuse downward. However, the correlation between ground temperature and meteorological variations is not yet fully understood. The Geodynamic Observatory Moxa (Thuringia, Germany), where several sensors like laser strain meters or tilt meters as well as a super-conducting gravity meter and a climate station allow high resolution observation of deformation and geodynamic parameters, is an ideal test site for long-term monitoring of the subsurface temperature distribution in boreholes using optical fiber temperature-sensing and electronic temperature-sensing. To unravel in situ geothermal properties at this test site we installed such temperature sensors in two scientific boreholes, KB-Moxa 13/1, which is 100 m deep, and the 20 m deep FB-Moxa 13/1. An optical fiber to measure temperature using the Raman-effect was installed in KB-Moxa 13/1, and in FB-Moxa 13/1, we installed an electronic temperature measuring chain with 20 sensors, respectively. Subsurface temperatures have been measured to a depth of 100 m and 20 m for almost one year. Besides the daily and seasonal temperature fluctuation, temperature anomalies were detected at two depths, 20 m and 77 m below ground surface. These anomalies most probable result from enhanced water flow in aquifers. Seasonal fluctuations could be identified down to a depth of about 30 m and diurnal temperature signals down to 1.2 m. Precipitation events may influence subsurface temperature still in a depth as deep as 15 m. Temperature variations caused by atmospheric changes are not detectable at a depth below 80 m. Core material from KB-Moxa 13/1 was available for measuring thermal diffusivity and thermal conductivity employing a Thermal Conductivity Scanner (TCS). Laboratory measurements confirm estimates of rock physical properties from the temperature measurements.