14 Electronic

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During the 97-98 period of this report, we were occupied principally with repair and further development of existing electronic equipment employed by various groups at our institute.

An alarm system for the detection of mercury was constructed for the group of Prof. W. Kündig (measurement of the gravitational constant) which had to fulfill safety regulations of PSI and SUVA. The device was needed in order to detect changes in the mercury level of two tanks each containing 500 l of mercury. The system for each container consisted of a distance sensor, an optically coupled preamplifier, a signal amplifier with two low impedance outputs (for DVM and ADC/PC), a window discriminator, a logic unit and the alarm. Very stable voltages sources were employed for the distance sensor. Mercury level variations were detected by the distance sensor which produced an output voltage proportional to the level variation. The amplified signals were shown on a digital display and also stored in a PC.

Four separate optical alarm systems were activated for level variations outside of allowed limits (±20 mm) as well as for the loss of the supply voltage and/or the signal lines. The system has been in operation for five months with a long time stability of better than ±0.1 mm.

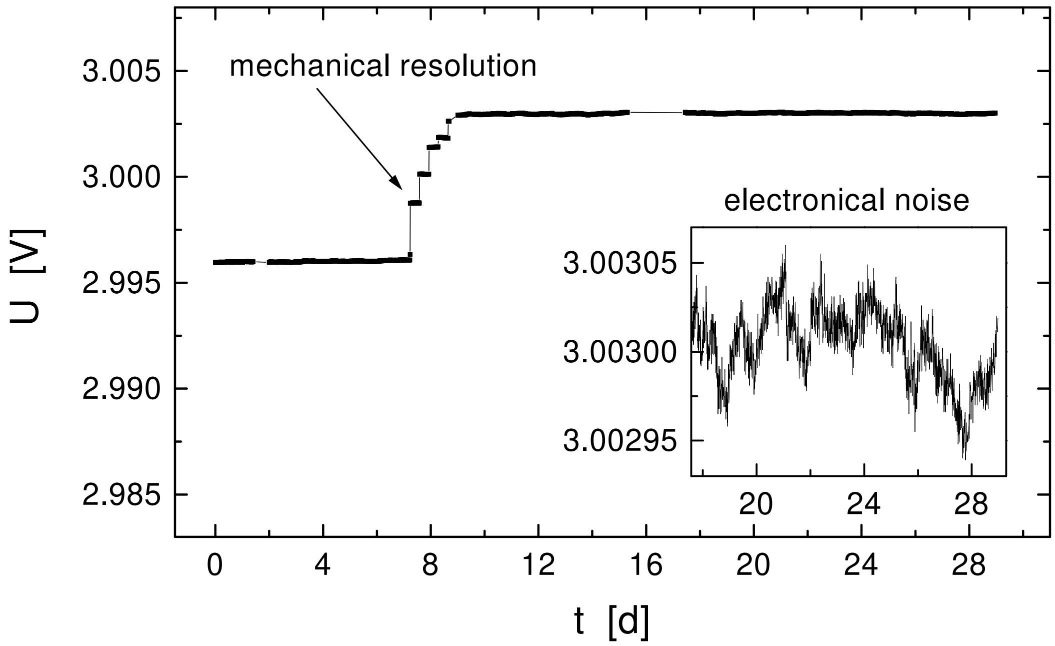

Figure 14.1: *Long time zero voltage fluctuation*