

## Data Transmission Method for Borehole Strain Meter using Feeble Radio Wave.

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Borehole instruments for crustal movement observation are installed into the ground with cement, therefore, we cannot make repairs the instruments. There are many electric circuits in the instruments such as the circuit of the displacement detector and data acquisition system. These circuits are often break down caused by the striking of lightning.

It is very important to intensify the electric circuits strong against the striking of lightning, especially, the protection of an output signal line is very important. In the case of multi-component instrument, we have to use a thick cable, for the usage of many signal lines and many electric power lines, and we have to protect all these lines against the striking of lightning. There is another trouble in the usage of the thick cable. The thick cable makes a difficulty to install the instrument into the borehole.

In order to decrease signal lines for borehole instrument, we developed an A/D conversion system and a digital transmission system which consumes very little electricity. Firstly, we convert analog signals into digital data. Secondly, we transmit the digital data to a receiver of the observation room with a feeble radio wave using a coaxial cable. Lastly, the digital data recieved by a recording system.

In this system, the feeble radio wave transmitted into the coaxial cable through a spiral coil. The radio wave from the coaxial cable received through another spiral coil of the receiving system and converted to the digital data. These spiral coils are very strong against the striking of lightning, therefore, we can easily protect the electric circuits of the system against the striking of lightning. This digital data transmission system with feeble radio wave is very useful for the borehole instruments.