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The development of the electrical exploration equipment for the characteristics of individual field

Shinichi Takakura^{1*}

¹AIST

The electrical prospecting which investigates a subsurface resistivity distribution is used for many fields. Because the range of resistivity of rocks and soils is dramatically wide, the electrical prospecting is helpful to discrimination of a stratum or a rock mass. For example, the resistivity of a hard rock or dry sand containing little water may often exceed 10000 ohm-m, while the resistivity of a soil or clay containing salt water may often below 1ohm-m. In a certain volcanic area, generally, the resistivity of a lava zone is high and the resistivity of an alteration zone is low. When the resistivity of the survey area is high, it is required to use a high power transmitter and a receiver with a wide dynamic range. On the other hand, a transmitter which can send large electric current and with a high resolution are required for a low resistivity area. However, equipment suitable for various fields is generally expensive. Moreover, such equipment is large-sized and it is hard to use in a mountain area. Thus, we have developed some electrical survey systems suitable for the characteristic of individual survey area and have carried out "custom-made electrical prospecting". This report introduces these systems and some of case studies which used them.

Keywords: electrical exploration, resistivity, development of equipment, custom-made electrical prospecting