

Effect of Noise from DC-Driven Trains to Geoelectrical Potential Difference and its Reduction in Hakuba Area, Japan

Hisashi Ishikawa[1]; Katsumi Hattori[2]; Ichiro Takahashi[2]; Yoichi Noda[3]; Toshiyasu Nagao[3]; Nobuhiro Isezaki[4]

[1] Graduate School of Sci.and Tech., Chiba Univ; [2] Chiba University; [3] Earthquake Prediction Res. Center, Tokai Univ.; [4] Dep. Earth Sci,Chiba Univ.

The variations of geoelectrical potential differences in Hakuba area, Nagano Prefecture, Japan have been investigated. The noises originated from the DC-driven trains were found to contaminate the natural geoelectrical potential data. The most intense influence of trains occurred when the train was running nearby measuring dipoles. The gradient of the potential was deflected towards the railways and/or the position of the train, exhibiting a certain correlation between the power supply data at substation data and the geoelectrical potential data at measuring sites. Extracting the high correlation part (r is larger than 0.7), idealized train noise can be computed by the least square method. The reduction of train noise by more than 60 percentages was achieved by subtracting the idealized noise from observed data.