

Electric conductivity change associated with the 2004 Niigata-ken Chuetsu Earthquake

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Stress concentration due to deformation of the crust may generate highly compressed fluids within cracks in the rocks. Those fluids tend to migrate upwards through crack system in the crust. Among them, the intrusion of water with high concentration of ions into a shallow water layer results in an increase in the conductivity of the water. An anomalous conductivity change has been observed at a hot spring well in Deyu, Agano City, Niigata Prefecture. The measurement is conducted manually at an interval of one week for the water pumped up from the well. Since the beginning of the observation in April, 2001, the values are almost constant at a level of 60-62mS/m till around June, 2003, when the rise of the conductivity occurred. The peak value of 63mS/m is recorded around the period between August and November, 2003. While decreasing after December, 2003, the conductivity tended to go up corresponding to the 2004 Niigata-ken Chuetsu Earthquake of M6.8. The maximum is 64mS/m at around January, 2005. The water temperature showed a rise of 0.3-0.4 degree centigrade corresponding to the precursory change at June, 2003 and at the time of the 2004 Niigata-ken Chuetsu Earthquake, respectively.

