

On GIC associated with past intense geomagnetic storms

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Geomagnetically Induced Current (GIC) of the electric power grid was measured in Memanbetsu, Hokkaido between 2005 and 2007 by cooperation with the Hokkaido Electric Power Co., Inc. However, few intense geomagnetic storms occurred in this period because of low solar activity near minimum. It is usually difficult to obtain GIC data at the moment of past intense geomagnetic storms. It is known that the maximum value of GIC is given with the value of electric field along the power line divided by power line resistance per unit length considering a single power line. Geoelectric data by earth current measurement in Memanbetsu, Kakioka, and Kanoya are provided from the Kakioka Geomagnetic Observatory of Japanese Meteorological Agency (JMA). Using those data, we estimate GICs at the moment of past intense geomagnetic storms such as the March 1989 storm associated with the electric power blackout in Canada and the October 2003 storm associated with the blackout in southern Sweden. The result of our analysis will be presented.

Keywords: Geomagnetically Induced Current (GIC), geomagnetic storm, earth current, power grids, space weather