

Research for electromagnetic induction response in the low-and-mid-latitudinal region at geomagnetic disturbances

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Various types of space weather phenomena such as storm and auroral substorm cause geomagnetic field disturbances. GIC (Geomagnetically Induced Current) is known as one of the space disaster phenomena, which possibly impact on the social infrastructure. To understand the process of GIC generation and their relations to space weather phenomena, we developed geomagnetic indexes, which possibly quantify the GIC phenomena. Especially, time differences of geomagnetic Z component are equivalent to radial component of rotational densitis of horizontal induction electric filed. This induction electric field may correspond to one of dominant electromotive forces for generation of GIC in the low- and mid- latitudinal region. As the first step to estimate the horizontal component of induction electric field from geomagnetic disturbances, we investigated detailed morphology of Z-component variations by using multipoint observational data of geomagnetic field in Japan (MMB,ASB,ESA,MIZ,KAK,KNZ,KUJ,KNY,CBI) during auroral substorms. We will discuss how geomagnetic disturbances and electric field variations are related each other during substorm.

Keywords: Electromagnetism, Space weather, GIC