

# Essays park



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As stated by (Campbell, 1989) the Solar Quiet (Sq) is a variation of geomagnetic field that excluded from any solar system disturbances. Sq variation is closely related to primary source currents at ionosphere specific at E region (90 - 150 km) altitude. Sq is generated by dynamo process where the driving mechanism of Sq is ionospheric wind dynamo. Sq is also driven by thermally excited solar tides (Chapman 1919). The ionospheric conductivity tends to rise up when there is an increasing of Sun activities, hence the total ionospheric current also increased. Since 1979, studies on Sq analysis have been carried out extensively for the past decades, but only few research has been made that focus on the application of Sq related to Earth interior.

As proof, the study on ionospheric electrodynamic have been done by (Richmond 1979, 1995b) and the magnetosphere and lower atmosphere coupling were conducted by (Wagner et al. 1980; Richmond 1995b). In the work of (Wagner et al. 1980; Richmond 1995b), they successfully determine a base level for geomagnetic indices using Sq current and (Svalgaard and Cliver 2007; Svalgaard 2016) able to monitor the solar radiation activity. Last but not least, there is study continuously being carried out in topic estimating electrical conductivity within the Earth structure and many areas that have been explored in a number of different countries by (Campbell and Schiffmacher 1988a; Campbell et al. 1998; Okeke and Obiora 2016). The Sq currents that induced into the Earth's lithosphere is apparent as the factor that can affect the underground event. Recently, Geomagnetically Induced Current (GIC) is one of the underground events associated with the external origin that causes adverse effects on the ground-based technological systems.

Even though the underground current is not totally new research, but it's relatively new in the equatorial region where this is the first work on GIC located in the equatorial region. There is numerous research that has been conducted in understanding the relationship between ionospheric current and the underground ground. The extent to that, application of Sq current in determining Earth conductivity is relatively new at Malaysia region where it can be applied for Sq analysis towards significant finding.