

Gabriel Graph of Geomagnetic S_q Variations

Muthusamy SRIDHARAN¹ and Ayyathurai M.S. RAMASAMY²

¹Magnetic Observatory, Indian Institute of Geomagnetism,
Pondicherry University Campus, Puducherry, India, e-mail: mopondy@bsnl.in

²Ramanujan School of Mathematics, Pondicherry University, Puducherry, India
e-mail: amsramasamy@gmail.com

A b s t r a c t

This paper describes the pattern of geomagnetic solar quiet day, S_q , variations recorded at the Indian geomagnetic observatories. The extent to which the high and low latitude ionosphere is interlinked electromagnetically during periods of quiet geomagnetic conditions is a point of debate. The concept of Gabriel graph is applied to derive the boundaries for the variations of horizontal, vertical, and declination components of the earth's magnetic field during geomagnetically quiet periods. Data of the six Indian geomagnetic observatories (Alibag, Hyderabad, Nagpur, Pondicherry, Visakapatnam, and Trivandrum) are considered for this analysis. This graph theoretical model is complementary to the classical data analysis techniques. Analytical method and the results of the analysis are presented in the paper.

Key words: geomagnetic S_q variation, Gabriel graph, Euclidean distance.