

EXPECTED TRENDS IN THE GEOMAGNETIC SQ FIELD DUE TO SECULAR CHANGES IN THE EARTH'S MAGNETIC FIELD

ANA G. ELIAS 1,2, Marta Zossi de Artigas 1,2

1. Consejo Nacional de Investigaciones Cientificas y Tecnicas, CONICET, Argentina, e-mail: anagelias@yahoo.com, mzossi@herrera.unt.edu.ar
2. Universidad Nacional de Tucuman, Facultad de Ciencias Exactas y Tecnologia, Dpto. de Fisica, Tucuman, Argentina

The geomagnetic Sq field variations are a manifestation of ionospheric current systems which flow in the E-region, so they could reflect the long-term changes observed in the ionosphere. These changes may be induced by several causes: the upper atmosphere cooling due to an increase in greenhouse gases, long-term changes in geomagnetic activity, and the Earth's magnetic field, generated in the Earth's core, which presents long term variations in the field's strength and orientation. The purpose of this work is the study of Sq trends as a consequence of long-term changes in the Earth's magnetic field. A theoretical analysis of the expected Sq trends is carried out first considering the effects of the magnetic field secular variations over ionosphere conductivity. Following, a statistical analysis of H daily range for several stations is made to assess experimental Sq trends. The theoretical results indicate that secular changes in the Earth's magnetic field can induce Sq trends, although experimental data do not entirely support this hypothesis.

Sq, ionosphere conductivity, Earth's magnetic field

Ana G. Elias, Universidad Nacional de Tucuman, Facultad de Ciencias Exactas y Tecnologia, Dpto. de Fisica, Av. Independencia 1800, 4000 Tucuman, Argentina, tel: 0054-381-4210116, fax: 0054-381-4364596, e-mail: anagelias@yahoo.com