

Occurrence of a Q-type ELF Burst in Kolkata in the 8 Hz frequency of Schumann resonance spectra

S S De¹, B Bandyopadhyay¹, T K Das¹, S Barui¹, Suman Paul¹, D K Haldar¹, Goutami Chattopadhyay¹ and B K De²

¹Centre of Advanced Study in Radio Physics and Electronics, University of Calcutta
1, Girish Vidyaratna Lane, Kolkata 700 009, India

²Department of Physics, Tripura University, Tripura (West), Suryamaninagar 799 130, India

E-mail: de_syam_sundar@yahoo.co.in

Abstract

Sudden enhancements in the recording of amplitude are found in the records of the first mode of Schumann resonance spectra of July 4, 2000 at Kolkata (lat: 22.56° N, long: 88.5° E). The outcome of the analyses of the recorded data has been identified as Q-burst, the characteristics of which will be presented in this paper. The results are validated with the observations from GOES satellite data.

The recorded waveforms are characterized by sharp initial pulses and then followed damped oscillations. These features of Schumann resonance transients are consistent with the characteristics of Q-bursts observed by Sentman (1989) and Sato *et al.* (2003).

The duration of this burst at Kolkata was 0.3 to 1 sec which took place during severe thunderstorms. The observed Q-burst dominated over the first Schumann resonance mode and it was caused likely by positive cloud to ground discharges followed by a large current moments and longer continuing currents.

References

- [1] Sentman, D. D., Detection of elliptical polarization and mode splitting in discrete Schumann resonance excitations, *J. Atmos. Terr. Phys.*, **51**, 507-519, 1989.
- [2] Sato, M., Fukunishi, H., Kikuchi, M., Yamagishi, H. and Lyons, W. A., Validation of sprite-inducing cloud-to-ground lightning based on ELF observations at Syowa station in Antarctica, *J. Atmos. Sol.- Terr. Phys.*, **65**, 607-614, 2003.