# Lightning Generated Sferics: Diagnostics Tools to Study Upper Atmosphere

SUSHIL KUMAR[1] , RAJESH SINGH[1], B. VEENADHARI[2]
[1]*School of Engineering and Physics, The University of the South Pacific, Suva, Fiji.*
[2]*Indian Institute of Geomagnetism, Navi Mumbai, India.*

Atmospherics or sferics that originate from lightning discharges on propagating large distances in the Earth-ionosphere waveguide, particularly at the night, form dispersed sferics called tweeks. Tweeks are novel diagnostic tool to monitor the nighttime D-region ionosphere. A small portion of lightning radiation can penetrate into the dispersive regions of ionosphere and magnetosphere and travel to the opposite hemisphere where it is received as tones of descending and ascending frequencies called "whistlers". In this talk the lightning sferics (tweeks and whistlers sferics) recorded at a low latitude station, Suva (18.2$^{o}$S, 178.3$^{o}$E, geomag. lat. 22.2$^{o}$S, $L$ = 1.17)) Fiji, in the South Pacific region, will be presented and shown how are they used to probe the night time D-region of the ionosphere and plasmasphere, respectively. The published results from other low latitude stations such as in India and Japan will be compared. The computed D-region electron density is then compared with the electron density profiles obtained from International Reference Ionosphere (IRI) 2001 model which matches well at the lower altitudes of 83-85 km.

**Key words:** Earth-ionosphere waveguide, tweek atmospherics, reflection heights, equivalent electron densities, whistlers, plasmasphere.