Canadian Association of Physicists | Association canadienne des physiciens et physiciennes

Contribution ID: **1836** Type: **CLOSED - Oral (Non-Student) / orale (non-étudiant)**

Recent developments regarding E region irregularities

Tuesday 30 May 2017 17:00 (15 minutes)

E region irregularities have been probed for decades through various frequency radars as well as rockets. Even though the maximum growth rate of the instability responsible for the development of the underlying structures should have produced magnetic field aligned irregularities moving at the electron ExB drift, they have been found instead to often move at the ion-acoustic speed times the cosine of the angle between the line-of-sight and the ExB drift, with a spectral width from 1/3 of the ion-acoustic speed along the ExB direction to something of the order of the ion-acoustic speed at right angles to that direction. There have also been many puzzling exceptions to the rule, with the detection at times of very narrow spectra moving at either the ExB drift or at something like 200 m/s, well below the ion-acoustic speed. Additional puzzles have included the detection of irregularities at aspect angles well beyond the values expected from linear growth rate expectations and the clear realization that the large scale structures were heating the electron gas at temperatures sometimes thousands of degrees above the expected 400K value. We now have acquired basic explanations to all the observed features, in large part because of additional insights provided by modern interferometry techniques. This talk will focus on the physical insights gained from the explanations, as there will be little time to go over much mathematics.

Authors: Prof. ST-MAURICE, Jean-Pierre (University of Saskatchewan); Dr CHAU, Jorge (Leibniz-Institute of Atmospheric Physics at the Rostock University)

Presenter: Prof. ST-MAURICE, Jean-Pierre (University of Saskatchewan)

Session Classification: T4-6 DASP General Contributions I (DASP) | DPAE: contributions générales I (DPAE)

Track Classification: Atmospheric and Space Physics / Physique atmosphérique et de l'espace (DASP-DPAE)