

## **Ionospheric Systems Research**

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This is a single scientist company which acts as a contractor to DSTO on background ionospheric research in support of Over the Horizon Radar and HF communications. As well, private research is conducted. In both cases, research is directed primarily to identifying experimentally the dynamics of the low latitude ionosphere and those common features which extend into Australia. The objective is to obtain a complete and detailed observationally determined picture of ionospheric variability. The following topics are pursued in collaboration with overseas organizations:

1. the inter-relationships between ionospheric critical frequency, height and Doppler variation under normal and ionospheric storm conditions. This includes Traveling Ionospheric Disturbances (TIDs) and the F3 layer
2. The day and night equatorial anomalies as observed by both ionosondes and the TOPEX/Poseidon satellite
3. the correlation in space and time of ionospheric variability and its sources.
4. post sunset changes in ionospheric critical frequency and height associated with the sunset ionospheric vortex, the development of equatorial bubbles, Equatorial Spread F and related late-night disturbances
5. true height analysis using POLAN and the calculation of synthetic Doppler
6. Sporadic E, both spread and non-spread in Doppler, Descending Intermediate Layers and tidal associations.

### **Recent External Publications:**

Lynn K.J.W, 1998, "Oblique Sounding in Australia", Ionosonde Network Advisory Group (INAG). Bulletin 62, p14, Jan., 1998.

Lynn K.J.W, Harris, T., Sjarifudin, M, "Stratification of the F2 Layer Observed in Southeast Asia", J.Geophys.Res. (Space Physics), V 105, No.A12, p27147, Dec.1. ,2000.

Lynn, K. J.W., M. Sjarifudin, Trevor J. Harris, Leo F. McNamara , 2002, "Spatial Correlation of F2 MUFs Observed over Low-Latitude Oblique Paths", Proc. Ionospheric Effects Symposium, Washington, 6-9 , May, 2002.

Lynn, K. J.W., M. Sjarifudin, Trevor J. Harris, "F1.5/F3 Layers in the Equatorial Ionosphere ", Ionosonde Network Advisory Group (INAG), Bulletin 63, 2002.

Lynn K.J.W, Harris T.J. , Sjarifudin, M and M. Le Huy, "Combined TOPEX/Poseidon TEC and Ionosonde observations of negative low-latitude ionospheric Storms", Annales Geophys V22, Sref-ID: 1432-0576/ag/2004-22-1.

Lynn, K. J.W., M. Sjarifudin, Trevor J. Harris, "Relationships between electron density, height and sub-peak ionospheric thickness in the night equatorial ionosphere ", Annales Geophys., in publication, 2006.