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General Delivery .
Wailuku, Maui
Territory of Hawaii
U.S.A.

Mr. G. R. Ellis
Ionospheric Prediction Service
Box 801 H
G.P.O.
Hobart, Tasmania, Australia

Dear Mr. Ellis:

Thank you for your letter of the 4th and enclosed reprint. Triple splitting is observed here rarely. When it does appear it is always associated with ionospheric storms and strong Spread F, usually in the daytime. This is in agreement with your observations about a very rough F layer being required. Actual inspection of the traces usually gives one doubts as to its existence at all because the reported Z trace is always confused with extraneous whips and broadening of the ordinary trace.

The experiment I am considering is associated with the longitudinal mode of propagation. Bremmer in "Terrestrial Radio Waves" discusses on pages 284 and 285 the condition whereby an extraordinary ray may pass entirely thru the ionosphere. Enclosed is a graph sheet which gives my evaluation of his equation 9c. Conditions at Hobart should approximate the area enclosed by the lines marked 0.6 gauss. The declination of a ray arriving via this mode of propagation will be equal to the latitude of the observer plus the dip of the earth's field less 90° . Thus the expected hole in the ionosphere should pass across the galactic center when viewed from Hobart. The winter months of April thru August when the F_2 criticals are lowest will be the best time to make these observations. Also the present years near solar activity minimum are necessary to secure the low criticals required.

If the above mechanism really operates, you should not get Z echoes whenever the conditions fall within the lines marked 0.6 gauss. Perhaps you can examine last years records for selected times of low night criticals and see if the data confirms or denies the above theory. Or, it might be more convenient to keep an eye open during the coming months to see how current results agree or disagree.

If the circumstances look auspicious, I will be interested in making some arrangement with the University of Tasmania to conduct experiments for measuring Cosmic Static from the galactic center at frequencies in the range 0.5 to 1.5 megacycle. My sponsor, the Research Corporation, will cover the expenses of the proposed tests. However, I will need some on the spot assistance in the form of introductions to people who can put up poles and string wires, as well as securing the use of a suitable place to try the scheme out.

The above general ideas have been discussed with Bowen and Pawsey of the CSIRO who seem to feel that they wish to confine their activities to Sydney. Unfortunately, the necessary geophysical environment is not available at Sydney and even less so here in Hawaii. Your comments and suggestions will be greatly appreciated.

Sincerely yours,

Grote Reber