

Survey of conditions for artificial aurora experiments at EISCAT Tromsø using dynasonde data

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Based on our recent papers [Tsuda *et al.*, 2018a; 2018b], we will present a brief survey on conditions for artificial aurora optical experiments in *F* region heating with O-mode at the EISCAT Tromsø site using dynasonde data from 2000 to 2017. The results obtained in our survey indicate the following: the possible conditions for conducting artificial aurora experiments are concentrated in twilight hours in both evening and morning, compared with late-night hours; the possible conditions appear in fall, winter, and spring, while there is no chance in summer, and the month-to-month variation among fall, winter, and spring is not clear. The year-to-year variation is well correlated with the solar cycle, and experiments by the current EISCAT heating facility (i.e., in the case of 4-MHz frequency operation) would be almost hopeless during the solar minimum. However, if an upgrade to the 2.7-MHz frequency operation (i.e., the second electron gyro-harmonic frequency operation) in the EISCAT heating facility is realized, chances for the artificial aurora experiments can be much enhanced even during the solar minimum. These findings are useful for planning future artificial aurora optical experiments.

References

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