

EXCITATION OF SINGLE AND MULTI-HOP WHISTLER-MODE
VLF SIGNALS WITH THE SIPLE STATION, ANTARCTICA VLF
TRANSMITTER

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Data from the Siple Station VLF wave-injection experiments are used to assess the conditions under which very low frequency signals from the transmitter located at Siple Station, Antarctica, are received at the conjugate station at Lake Mistissini, Quebec, in the 1986 operating year. The purpose of the study is to begin to quantify the statistical occurrence of the growth, amplification and emission triggering processes and their dependence on geophysical conditions. This year (1986) was the final period in which Siple was operated year-round and this study is the first methodical review of this data. The 1986 data show that days of strongest Siple activity tended to coincide with days of strong, often multi-hop whistler activity on paths with endpoints within a few degrees of the Siple latitude. They also tended to coincide with days of strong natural noise band activity propagating on paths within a similar range of Siple's location. These results confirm the results of previous studies. In addition, the data from the receiver at Siple Station were reviewed for the occurrence of multi-hop propagation of Siple signals. The conditions for multi-hop reception were observed less frequently than the conditions for single-hop reception, and multi-hop reception at Siple coincided with reception at Lake Mistissini in every case. Finally, the response to a frequently transmitted, diagnostic format was studied on a few of the most active transmitting days in the period. This format was transmitted four times every hour, containing a variety of ramp, staircase, and continuous pulses at a number of frequencies. Study of the response to this format allows the exploration of the short-term variation of reception activity.

Abstract Submission Form

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