

# **Multi-year Analysis of Atmospheric Gravity Waves in the Polar Mesosphere and Thermosphere**

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The Polar Regions play a unique role in understanding the Earth's geospace environment, due to the direct connectivity to the interplanetary field system. In recent years, an appreciation of the impact of atmospheric gravity waves (AGW) has evolved through ground-based and satellite observations, as well as modeling studies. Studies of AGW are numerous at low- and mid-latitudes over the last several decades, while the Polar Regions have eluded the scientific community. However, observations from a few stations on the Antarctic continent have been accomplished in the last decade, and recently lead to the initiation of a comprehensive Antarctic observation network (ANGWIN). Recent efforts to establish long-term measurements in the Arctic region have provided a multi-year effort from Poker Flat, Alaska, characterizing a broad spectrum of AGWs from the lower atmosphere and into the thermosphere.

In this study, we present a long-term climatology from Antarctica, as well as introducing a multi-year effort from Poker Flat, Alaska, characterizing a broad spectrum of AGWs from the lower atmosphere and into the thermosphere. Furthermore, we discuss potential impact of solar variability on the propagation of these waves and their characteristics in the thermosphere.