

VHF Atmospheric and Meteor Radar Installation at Davis, Antarctica: Initial Observations of Atmospheric Winds and Polar Mesospheric Summer Echoes (PMSE)

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Abstract

A 55 MHz VHF atmospheric radar was commissioned at the high-latitude station Davis (78.0°E, 68.6°S geographic; 74.6°S magnetic), Antarctica during the austral summer of 2002-03. This paper presents an overview of this new facility which has been constructed for the Antarctic environment including, the 12 x 12 array of Yagi antennas, equipment module, and associated infrastructure. Several aspects of the design tailored for the harsh Antarctic conditions are described. The radar specifications as developed by Atmospheric Radar Systems will be given together with an account of the proposed science to be conducted utilizing this new facility. The radar commenced 'spaced antenna' mode observation with 20 kW of transmitted power from mid February 2003, and is scheduled to be upgraded to 120 kW of transmitted power and a beam steering capability from December 2004. Some initial troposphere and stratosphere region wind observations are presented. The first reported observations of Polar Mesospheric Summer Echoes (PMSE) at the high southern hemisphere latitude of Davis are presented. The facility includes a meteor radar capability and some preliminary mesosphere region results are also presented.