

Ship-borne VHF radar for mesospheric and ionospheric research¹

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Abstract

This paper describes a VHF coherent radar installed on board the Peruvian research vessel "Humboldt". The system has been designed and developed at Jicamarca Radio Observatory. The radar's antenna is a COCO array of 21 x 24m, specially designed to be installed on a ship. System description is included, as well as first results from observations of Polar Mesospheric Summer Echoes (PMSE) in Antarctica, and Equatorial Electrojet along the southern Peruvian coast.

The radar is a powerful mobile tool for the study of the latitudinal variations of the phenomena mentioned above and other ionospheric phenomena. The Humboldt radar and the MST radar at the Peruvian Antarctic station have been operated simultaneously to make PMSE observations over different Antarctic latitudes. In addition, observations were carried out during the last austral summer, concurrent with a mesospheric temperature-measuring campaign using falling sphere techniques. They allow the study of the possible relationship between the mesopause temperature and the existence of PMSE. Equatorial Electrojet observations have been carried out simultaneously by the Jicamarca Radar Observatory and the Humboldt radar at different latitudes to study the latitudinal extend of the Electrojet-irregularities.

¹ To be presented at the Progress in Electromagnetic Research Symposium (PIERS 1999), Taipei International Convention Center, Taiwan, March 22-26, 1999.