

Remote Sensor Data Transmission from Antarctica to Spain with a long-haul HF ionospheric link

R.M. Alsina-Pagès, D. Badia, P. Bergadà, M. Hervàs, F. Orga, J.L. Pijoan, J.R. Regué, M. Salvador
GR-SETAD La Salle, Universitat Ramon Llull, Quatre Camins 30, 08022 Barcelona, Spain
D. Altadill
Observatori de l'Ebre, (OE), CSIC - Universitat Ramon Llull, Horta Alta 38, 43520 Roquetes, Spain

The link

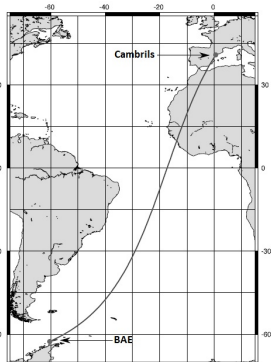


Fig 1: 12760 km link map
BAE: Spanish Antarctic Station



Fig 2: Ionosonde antenna



Fig 3: Geomagnetic sensor

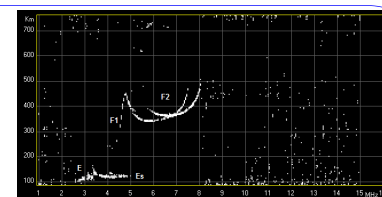


Fig 4: Ionogram showing F1 and F2 layers reflections

Fig 5: Geomagnetic sensor



Remote sensing

Sounding results

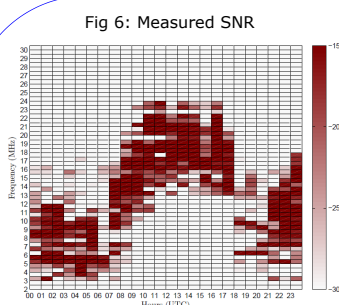


Fig 6: Measured SNR

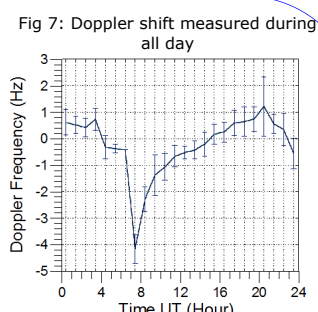


Fig 7: Doppler shift measured during all day

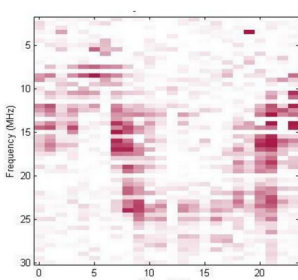


Fig 8: Narrowband availability for frequency range [3,30MHz]

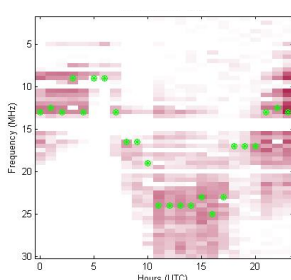


Fig 9: Wideband availability for frequency range [3,30MHz]

System description

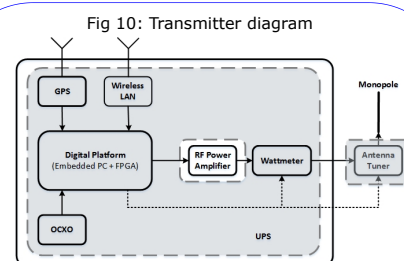


Fig 10: Transmitter diagram

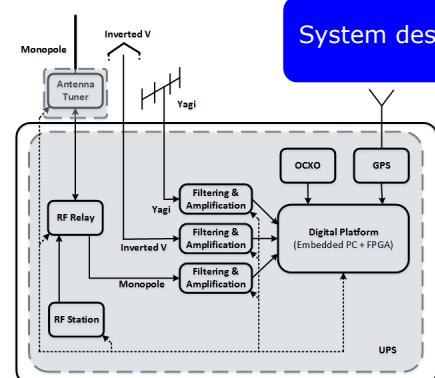


Fig 11: Receiver diagram

Modulation results

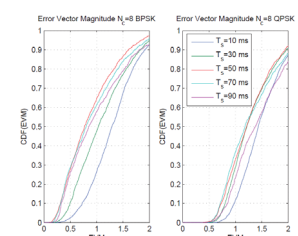


Fig 12: Cumulative Density Function of EVM in a OFDM modulation

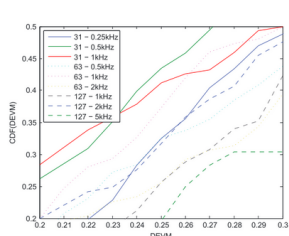


Fig 13: Cumulative Density Function of EVM in a DS-SS modulation

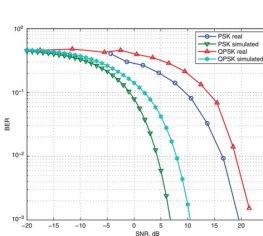


Fig 14: BER vs SNR in a SC-FDE modulation

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The places



Cambrils

BAE

