

Interannual variation of a 12,760 km transequatorial ionospheric channel availability and its dependence on ionization

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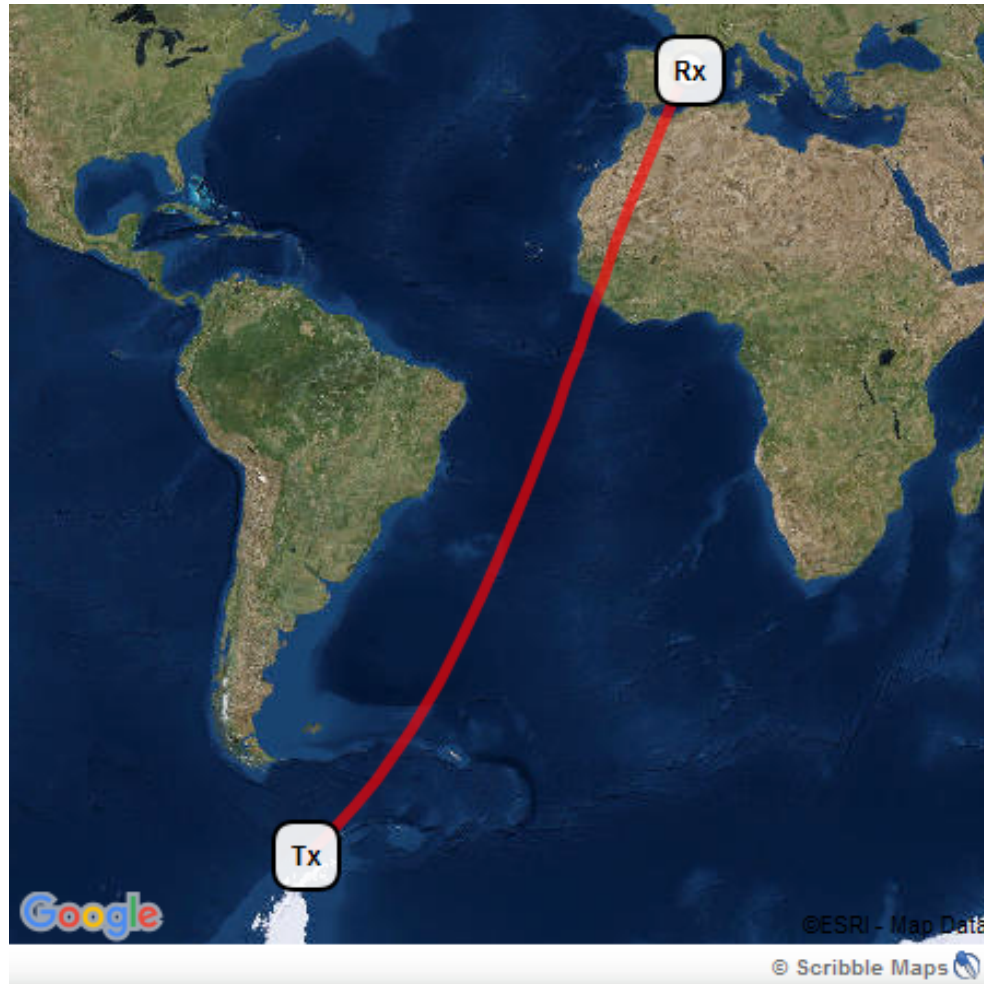
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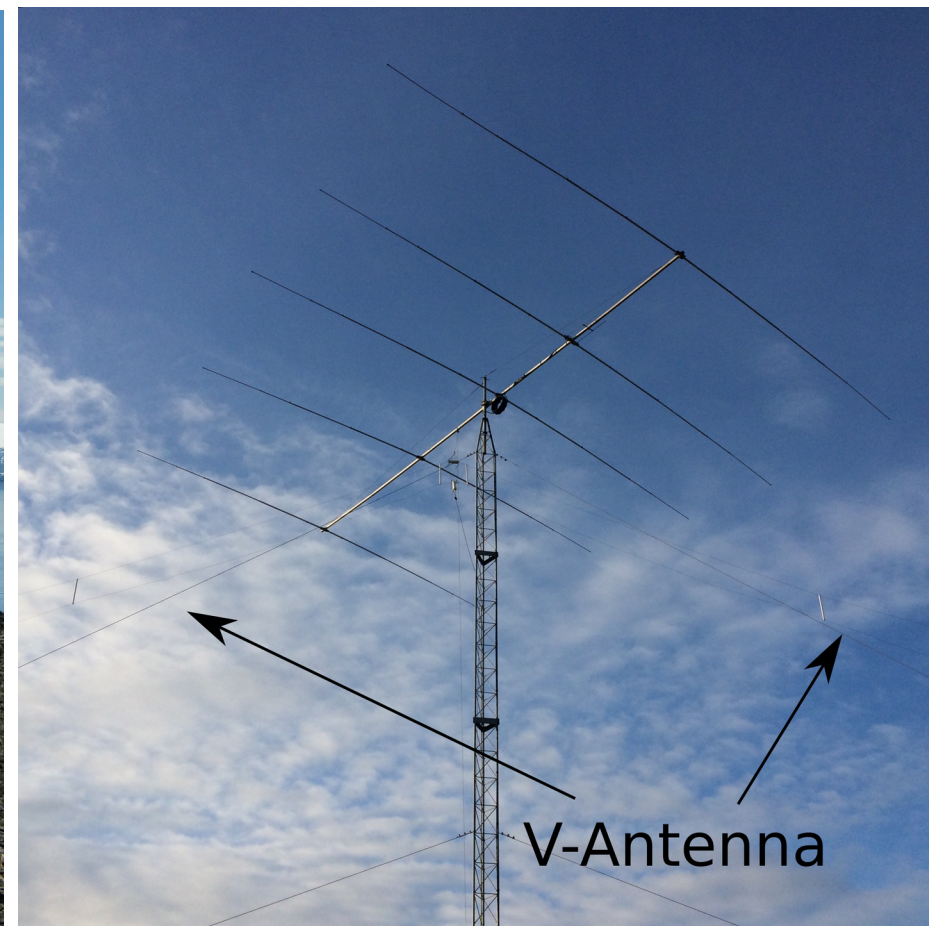
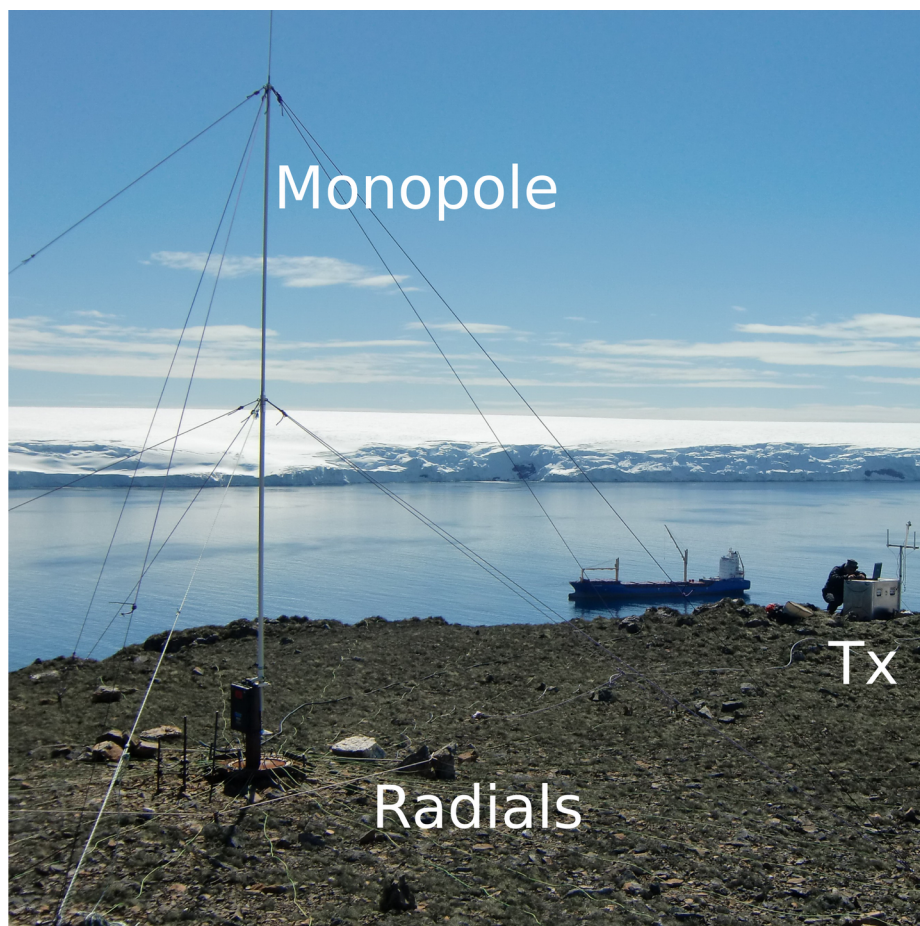
1. Description of the link and the antennas
2. Goals of our paper are presented
3. Sounding diagram
4. General dependence study for the last four surveys
5. Detailed interday dependence for the 2012-13 survey
6. Conclusions

Our HF long-haul link



La Salle and the Observatori de l'Ebre have been sounding the 12,760 km ionospheric channel from Antarctica (62.7°S , 299.6°E) to Spain (41.0°N , 1.0°E) during the last 11 years.

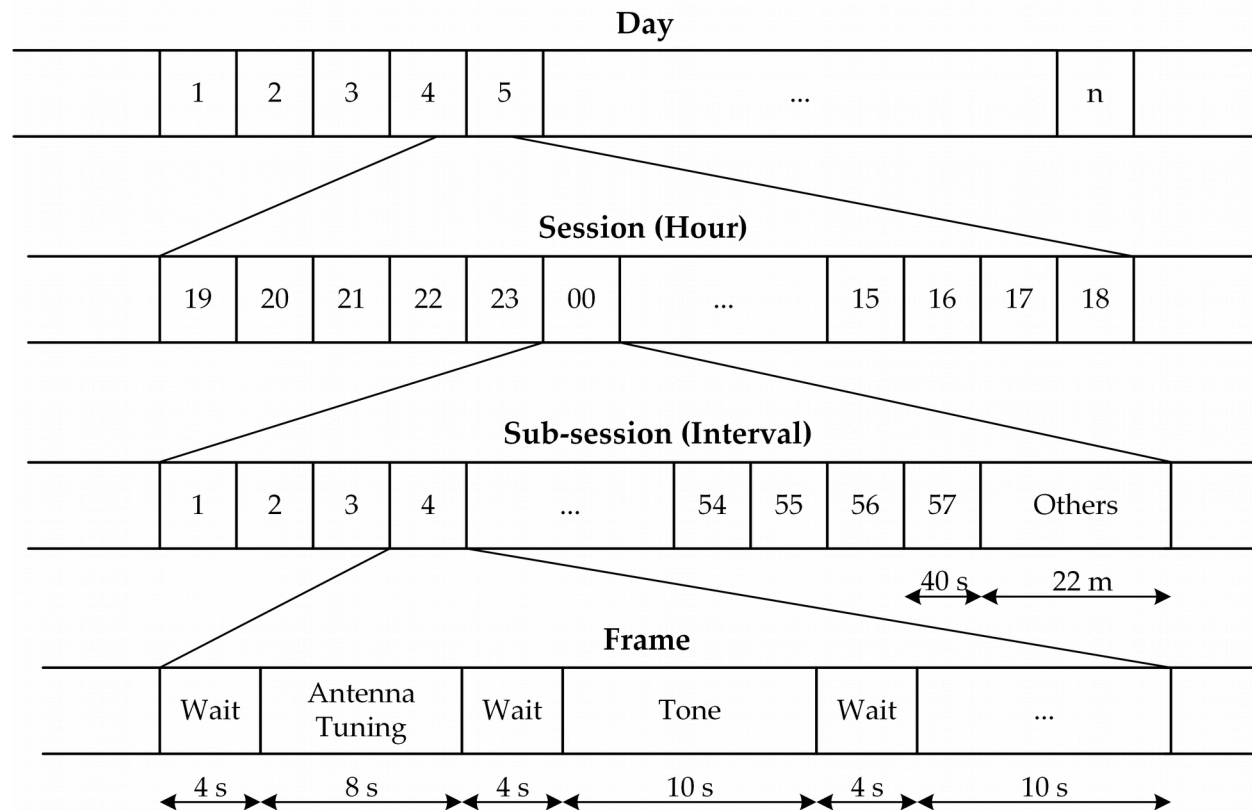
System Antennas



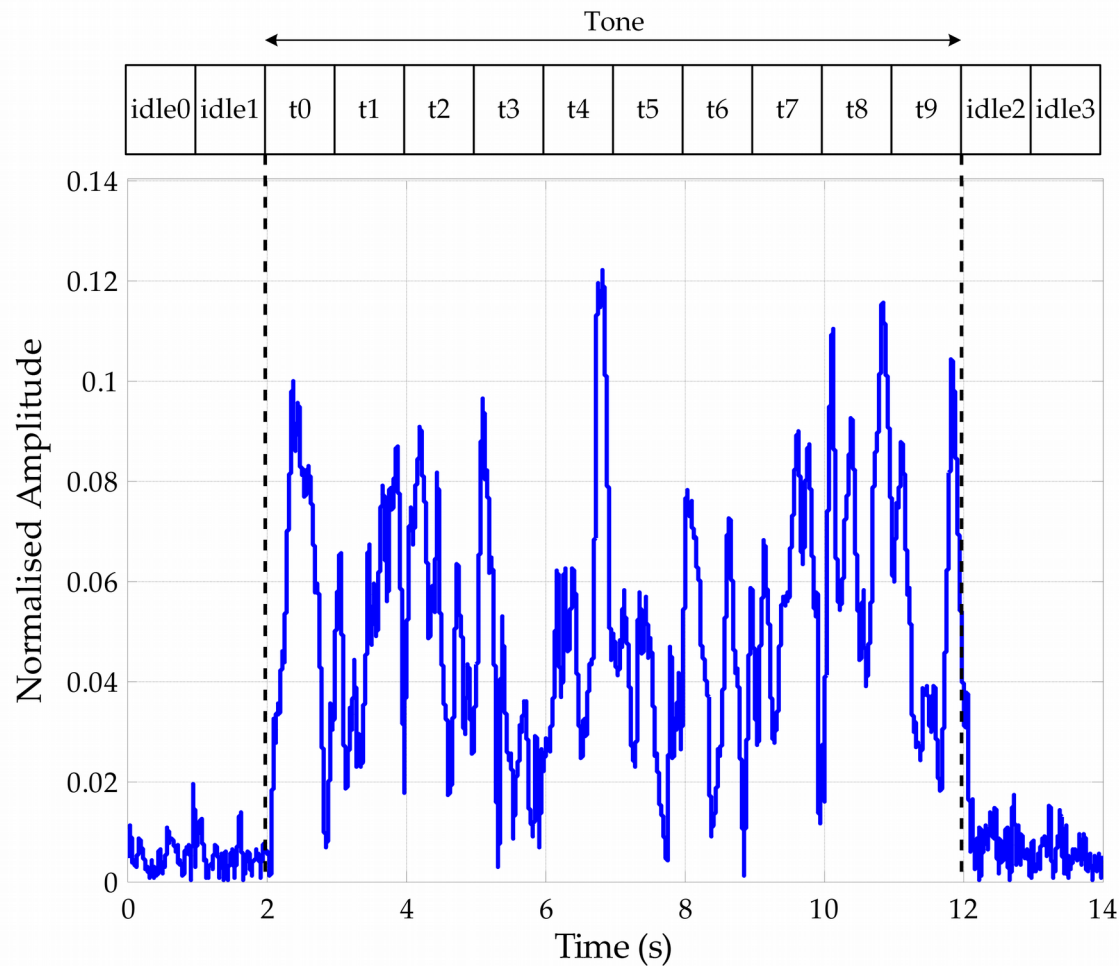
Goals

- To prove the relation between the channel availability and the Sun phenomena affecting the ionization in four consecutive sounding campaigns
- To demonstrate the importance of the Sunspot Number index concerning the ionization of the channel
- To study a first comparison between the four surveys and to focus in some specific transmissions as examples

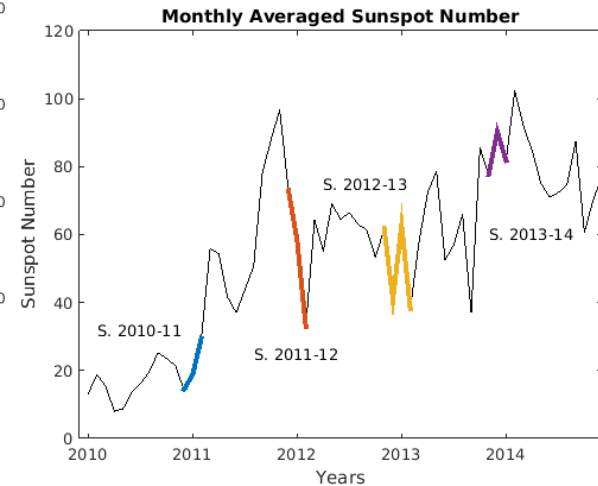
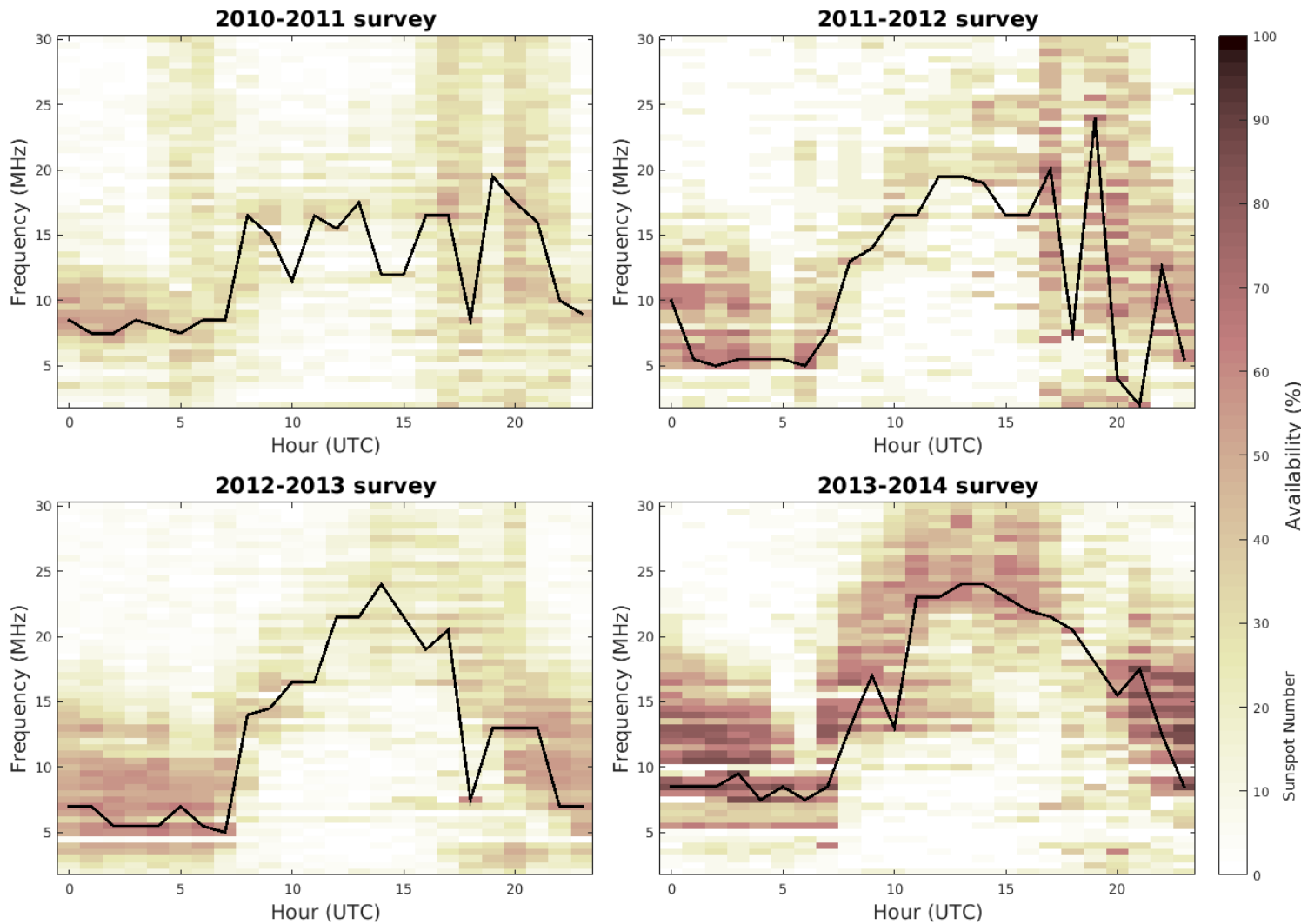
Diagram of the sounding



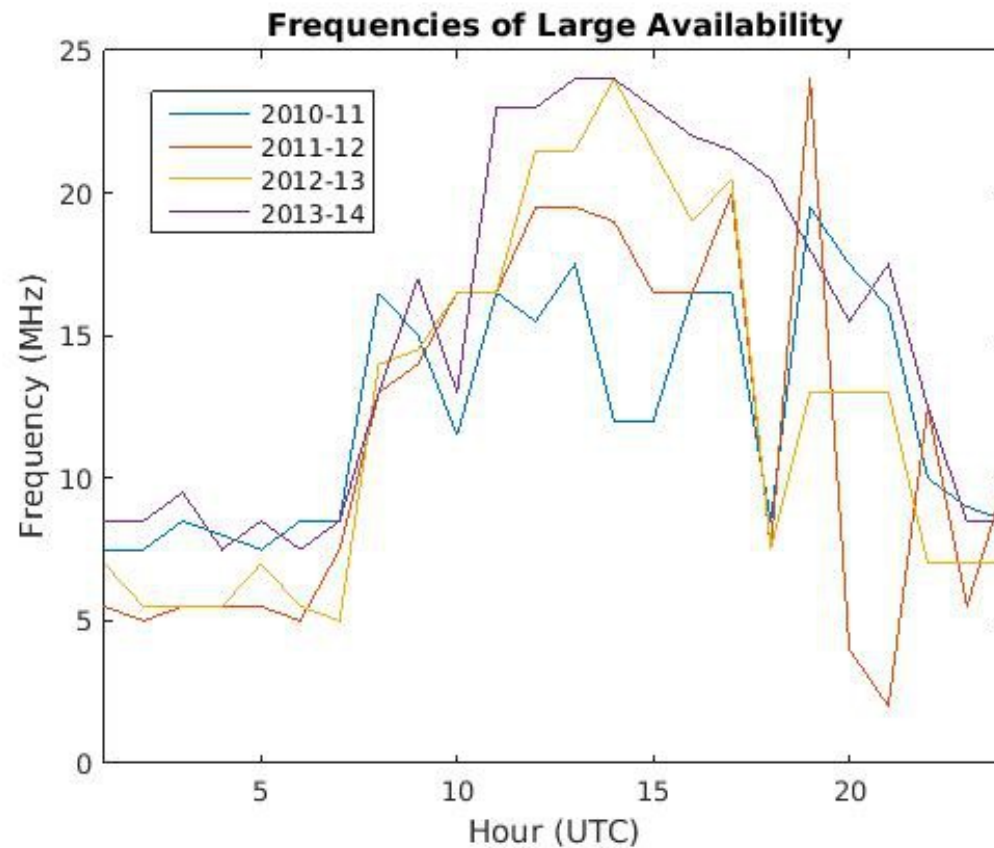
A Narrowband-Sounding Frame



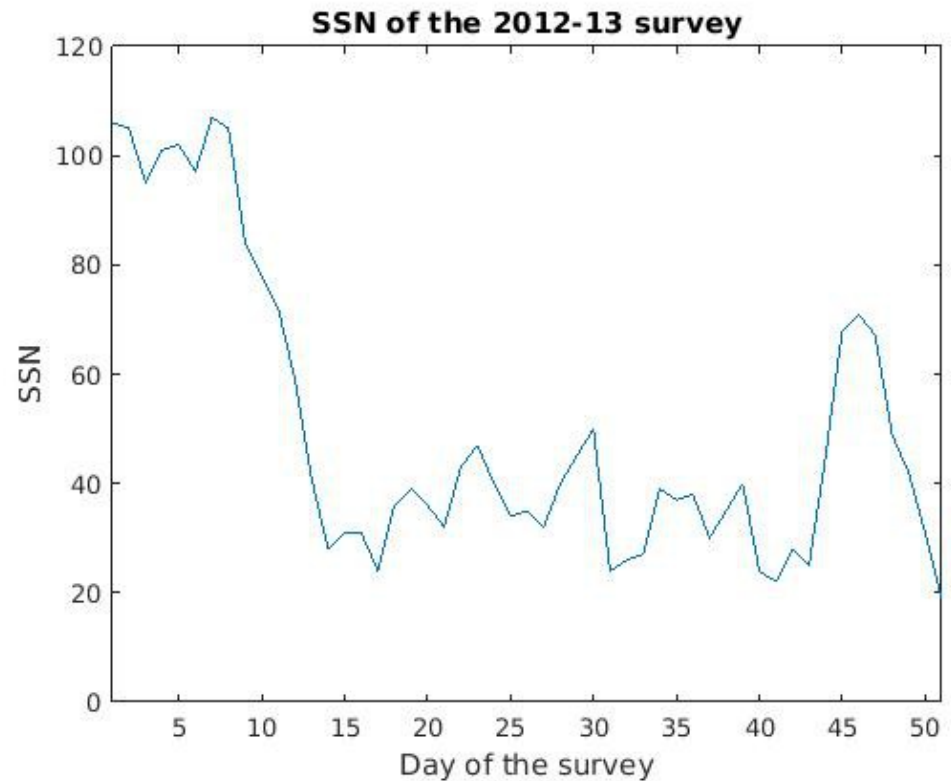
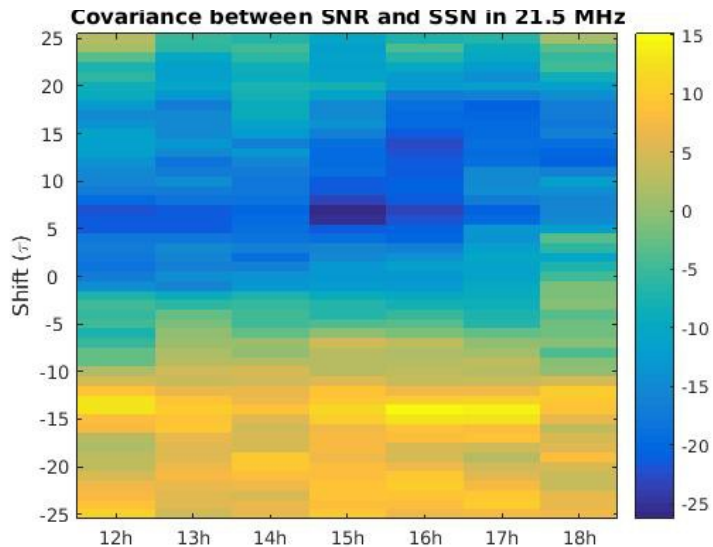
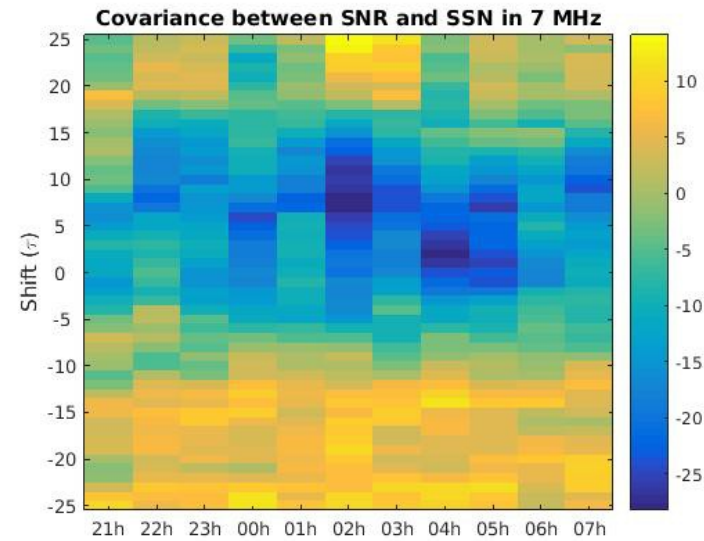
Availability and FLA for the last four surveys



Frequencies of Large Availability



Two examples of covariance in 2012-13 survey



Conclusions

- The narrowband propagation has strong dependence on the solar variations due to its influence in the ionospheric performance
- 1st study: the higher the SSN, the higher the Sun activity and the better the performance of our channel in general terms
- 2nd study: when analyzing the interday variation, a strong inverse dependency of the SNR and SSN is shown, delayed around 6 days