

Radio propagation in the LF and HF bands using modern digital communications.

Intercontinental radio communications has long used the Low Frequency (LF) and High Frequency (HF) radio bands, where the Earth's ionosphere reflects radio waves, enabling communication far beyond the horizon.

Modern hardware and signal processing techniques allow new experimentation and development for radio communication hardware and experiments in these bands.

This project aims to measure the properties of the ionosphere using modern wideband software radio systems and utilising digital radio transmitters as active high-power probes of the ionosphere.

Research Field

Radio Astronomy/Engineering

Project Suitability

PhD, Masters, Eng 4th year

Honours (as appropriate)

Project Supervisor

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Co-Supervisors

Prof. John Kennewell

Aims of project

- (i) Long-term observation and monitoring of international digital radio broadcasts
- (ii) derivation of the propagation and signal scattering environment
- (iii) Improved models of the large-scale density and turbulent structure of the ionosphere.

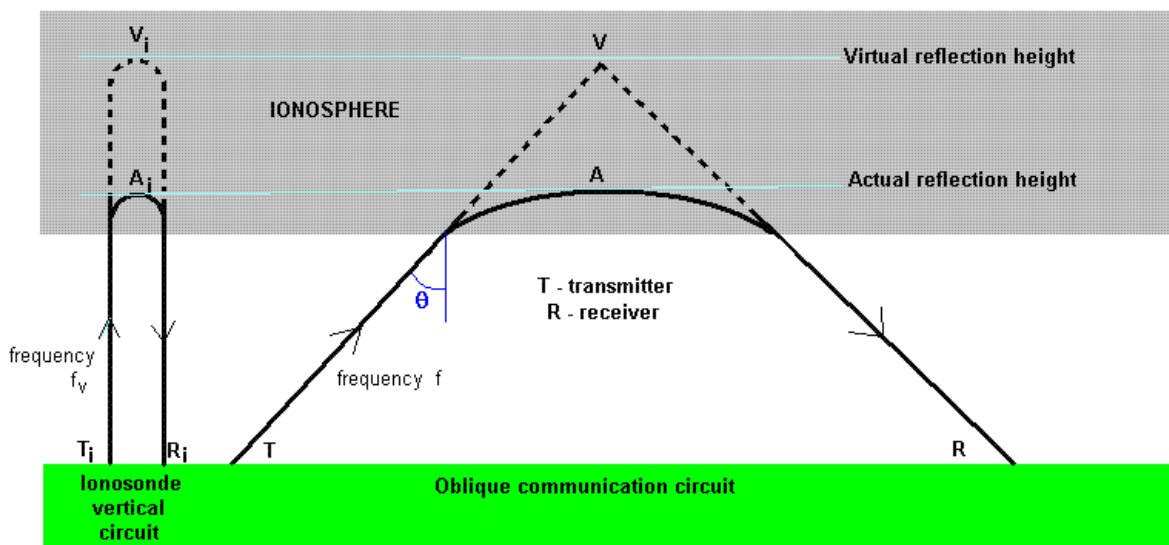


Figure 1: Schematic of radio propagation. <https://www.spaceacademy.net.au/library/notes/rviono.htm>