



SunDish Project: Single-Dish Solar Radio Imaging with INAF Radio Telescopes

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Mapping of the brightness temperature of the solar atmosphere in the radio band reveals plasma processes mostly originating from free-free emission in the local thermodynamic equilibrium, providing a probe of physical conditions in a wide range of atmospheric layers.

In particular, long-term diachronic observations of the solar disk in K-band represents an effective tool to characterise the vertical structure and physical conditions of the solar chromosphere both for quiet and active regions, during their evolution at different phases of the solar cycle. Within this context, the Medicina 32m and SRT 64m radio telescopes could have an important role in the international solar radio science panorama.

After a first test campaign aimed at defining and optimising solar imaging requirements for the radio telescopes, the system is ready for systematic monitoring of the Sun to provide: (1) accurate measurement of the brightness temperature of the radio quiet Sun component, that has been poorly explored in the 20-26 GHz range to date, and representing a significant constraint for atmospheric models; (2) characterisation of the flux density, spectral properties and long-term evolution of dynamical features (active regions, coronal holes, loop systems, streamers and the coronal plateau); (3) prediction of powerful flares through the detection of peculiar spectral variations in the active regions, as a valuable forecasting probe for the Space Weather hazard network.

We publish updated project information and our solar images in a dedicated web site (<https://sites.google.com/inaf.it/sundish>), just after each solar observing session to ease their full exploitation by the wide multi-wavelength solar community, empowering both physical modelling and Space Weather forecast.