

Title

**The First Pilot Observation of Interplanetary Scintillation for Space Weather and Astrophysical Studies**

Abstract

Solar wind and coronal mass ejections (CMEs), while having direct consequences on the space-weather (SpWx) environment, are very hard to observe and characterize. Among different techniques, interplanetary scintillation (IPS) is an excellent and well-understood observing technique for studying the vast heliosphere using ground-based radio observations. IPS is not only important for SpWx studies, but it is also a unique observing technique to detect sub arcsecond compact structures in radio sources, which is not possible to achieve using standard radio interferometers. Although very long baseline interferometry (VLBI) observations can easily detect sub-arcsecond sources, most of the VLBI observations are limited by narrow field-of-view (FoV) instruments, making surveying a large part of the sky highly time-consuming. This pilot project is the first with MeerKAT to demonstrate its capability for IPS observations of occulted radio sources at smaller solar elongations (~ 4 -10 degrees). This project extends the scientific portfolio of MeerKAT on the existing capabilities of MeerKAT to expand into the increasingly important field of SpWx research as well as identify sub-arcsecond radio sources in different surveys being carried out by MeerKAT.