53rd IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

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HIGHEST RADIO FREQUENCY TECHNOSIGNATURE SEARCHES WITH THE SARDINIA RADIO TELESCOPE

Abstract

The quest for radio signals from technologically-advanced extraterrestrial intelligence has traditionally concentrated on the vicinity of 1.4 GHz. In this paper, we extend the search to unprecedented territories, detailing our extensive observations at 6 GHz and initiating the first-ever survey at 18 GHz with the Sardinia Radio Telescope (SRT). Our strategy entailed rigorous observation sessions, totaling 36 hours, directed towards the Galactic Center and 72 selected TESS targets—making this the most comprehensive high-frequency technosignature search to date. Despite encountering numerous false positives, predominantly from human-made interference, our narrowband signal search found no definitive evidence of drifting signals that could suggest an extraterrestrial origin from the surveyed regions. Nevertheless, our efforts have enabled us to set new constraints on the presence of radio emissions from approximately $5 \cdot 10^5$ stars, establishing an isotropic radiated power limit of $1.8 \cdot 10^{19}$. We also provide a comparative analysis of the 'hits' recorded across both frequencies and underscore the significance of pursuing technosignature searches at higher frequencies, where the spectral landscape is less congested and more conducive to detection.