

48th IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) –
The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

Author: Mr. J. Emilio Enriquez
UC Berkeley / Radboud University Nijmegen, United States, e.enriquez@berkeley.edu

Dr. Andrew Siemion
Univerisity of California, United States, siemion@berkeley.edu
Prof. Heino Falcke
Radboud University Nijmegen, The Netherlands, H.Falcke@astro.ru.nl
Prof. Mike Garrett
University of Manchester, United Kingdom, magarrett1964@gmail.com

A SEARCH FOR TECHNOSIGNATURES FROM THE SOLAR NEIGHBORHOOD WITH LOFAR

Abstract

Within the context of astrobiology, the search for technosignatures with sensitive radio telescopes could shade light into the prevalence of intelligent life in the galaxy. We performed a search of artificial signals on a volume limited sample of nearby stars with LOFAR. We include all stars within five pc irrespective of their spectral type. This is the first search of narrow-band signals at low frequencies. We exploit the full frequency coverage available to LOFAR. We perform a thorough search of narrow band signals of artificial origin with drift rates up to ± 10 Hz/s. At the LOFAR frequencies, the accelerations probed here covered any possible rotation caused by a rocky planet, potentially the largest accelerations proved by any search of this kind. We used a novel multi-beam approach for RFI excision. None of the signals found are consistent with being originated from the directions of our targets. We place upper limits to the power of putative transmitters with an EIRP of 1.6×10^{11} W, a value reachable by our own technology. Given the small sample of stars, only a loose limit on the number of transmitters in the galaxy can be placed. The novel multi-beam approach presented here can be be incorporated by new wide field arrays coming online.