



Systematic Search of the Nearest Stars for Exoplanetary Radio Emission: Preliminary results from LOFAR

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Radio observations have been used as a tool to search for exoplanets since before the confirmed discovery of the first extrasolar planet. To date, neither targeted observations of known exoplanets nor surveys have produced definitive detections of exoplanetary radio emission. We present the framework for, and initial results from, a blind radio survey of the nearest star systems for exoplanetary radio emission. The very closest stars were chosen to minimize the dilution of potential radio signals by distance and thereby increase the probability of a detection.

The goal of this survey is to obtain, at minimum, physically meaningful upper limits on radio emission from (or modulated by) substellar companions of the nearest stars. The target selection criteria for this survey are restricted to distance, observability for LOFAR and the VLA, and data quality metrics only. Stellar properties are not considered because preconceptions about the types of systems most likely to exhibit radio emission have not been observationally confirmed and may be incorrect.

Two survey targets, GJ 411 and GJ 725A/B, have been observed with the LOFAR telescope LBA (30-75 MHz) system. A series of 4 2-hour integrations and 1 3-hour integration were made for each target of a period of approximately 2 weeks. Additional observations are underway with LOFAR as well as the VLA. Preliminary results from the first LOFAR observations are presented.