

PROBING EXTRASOLAR PLANETS FOR SIGNS OF INTELLIGENT LIFE: RECENT SETI OBSERVATION CAMPAIGNS WITH THE ALLEN TELESCOPE ARRAY

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Abstract: Since the first extrasolar planets were discovered, SETI Institute's Center for SETI Research has conducted astronomical observing campaigns that point radio telescopes toward those planets and search for signs of extraterrestrial radio technology like the clearly artificial signal shown in Fig. 1. We have recently made dramatic progress, probing exoplanets with observations 12 hours a day, every day, with our own radio interferometer the Allen Telescope Array (ATA). SETI Institute's team has by now examined all those exoplanets over ATA's very wide, continuous frequency range from 1-9 GHz. These observations till mostly virgin soil, including large ranges of frequency barely explored and not explored by any previous SETI search.

Kepler telescope's remarkable success has greatly expanded the list of known (confirmed) exoplanets as well as an ever larger number of likely "Kepler objects of interest" (KOI) most of which are expected to be exoplanets. SETI Institute has undertaken a search of all KOI and has made substantial progress on this, much larger list of interesting targets.

Here we shall review the observations, including protocols, sensitivities as a function of frequency, and their outcomes. We shall include a brief discussion of our signal databases and what information can be extracted from the millions of signals stored in them. We ask: Can statistical analyses bring out new information not evident in an examination of signals one at a time? Come and find out.

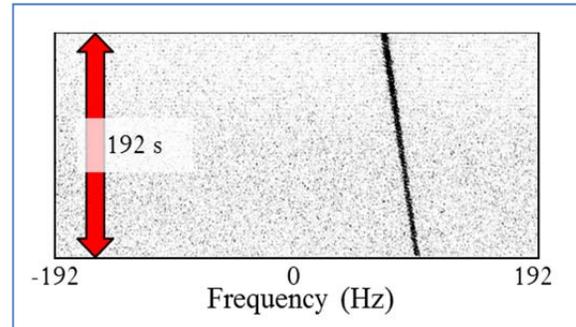


Figure 1: Spacecraft like ISEE3 transmit narrow-band (few Hz) signals like the one depicted above. This waterfall shows the ISEE3 transmission as measured by ATA during that spacecraft's recent closest-approach to Earth. The vertical axis represents time, with the earliest time at the bottom. The frequency axis on the bottom is centered near 2217 MHz.