41st SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

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TARGETED SETI ACTIVITY IN THE UPLINK SPACECRAFT COMMUNICATION CHANNELS.

Abstract

In the past forty years a great number of space probes have been spread around in the solar system. For every probe a number of radio uplink and downlink have been performed, and in this way radio transmissions of data leaved the solar system directed to the external space, along the ecliptic plane. The uplink transmissions from the Earth-based antennas to the spacecrafts could have reached a number of exoplanets in the trajectory of the antenna beam, that potentially host intelligent life. If a technological civilization is hosted in such planets, and it have received one of our signals and classified it as 'alien signal', we can argue that the inhabitants of such a society could send a reply, using the same parameters of the signal, as for example frequency, bandwith, modulation and correct power calculated to reach us . The aim of this contribution is to analyze the probability that a signal transmitted in S and/or X band, historically used for the communications with the spacecrafts, could be received from one of the known exoplanets or the candidates. An analysis of such a scenario has been performed in a range of twenty light-years from the Earth: this distance assure that a signal had time enough for a round trip Earth-exoplanet-Earth, and that a reply could be received from Earth-based antennas in the next years. This method gives a new criterion for a possible targeted SETI program of observations, that can be performed being fixed some important parameters; 1) the frequency band of observation, about forty MHz in S and X uplink band, moreover protected from RFI; 2) the sources, about ten selected from a catalogue that are in a strip of few degree around the ecliptic plane, 3) the type of the signal that we expect to receive, the same that was transmitted less than forty years ago to reach a human probe around the solar system.