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Author: Dr. Ugur Guven
UN CSSTEAP, United States

SETI SEARCH: PLAUSIBILITY OF A SETI PROBE AND SEARCH PARAMETERS FOR AN INTERSTELLAR SETI SEARCH

Abstract

Since the dawn of time, mankind has looked upon the stars and has wondered whether he is alone in the universe. There are many prehistoric artifacts and Sumerian transcriptions to suggest that this question has been pondered even during ancient history. In the modern world, the search for extraterrestrial intelligence continues as a community academic effort with radio telescopes and several studies all across the globe with the help of formal organizations as well. While some potential data has been analyzed that has initially looked promising, unfortunately no conclusive data exists on the presence of extraterrestrial intelligence. Of course, vastness of the universe and the observation of several exoplanets suggests that it may be a probable possibility. In addition, the efforts for SETI with the phonetic recordings in Voyager 2 must be mentioned as well. Many scientists agree that the best way to do a SETI study is in outer space away from the atmospheric and magnetic distortions of Earth. While there have been many strides in Radio Astronomy, the actual search with a probe can be far more useful and efficient for various reasons. There have been some proposals to suggest that SETI search can be conducted with nanosatellites, but their low power output and limitations in terms of orbit stability doesn't make them a good candidate. In retrospect, it makes more sense to create more advanced SETI probes that function on nuclear power to give them the high specific impulse and long term longevity capability to search far reaches of the solar system and interstellar space. Various data suggests that the probe would need to exit the Heliopause to increase the probability of scanning for the necessary signs of extraterrestrial life. Of course, a special spiral search pattern will have to be calculated along with the necessary orbital mechanics to maximize the search pattern while reducing the amount of energy needed for such a search operation. Especially with the advents in advanced nuclear technology with helium cooled modular reactors or gaseous core reactors with Uranium Hexafluoride, it can be possible to reach very high speeds with high acceleration capability to have a meaningful search within the lifetime of the probe. This paper presents this novel concept with illustrations and simulations to provide the scientific community with a plausible method that is attainable with early 21st century technology, which is also within budgetary reach of our modern world.