38th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4)
SETI I : SETI Science and Technology (1)

Author: Mr. Karan Molaverdikhani
United States, k.molaverdi@gmail.com

EXTRASOLAR PLANETS DETECTION FRACTAL MAP

Abstract

"Are we alone?" This is a mankind question for a long time. Galilei saw the Jupiter's moons 400 years ago and now we know about the multiplanetary stellar systems and till now have found more than 340 extrasolar planets that shown we are close to find answer. KEPLER will launch soon to survey a wide region of the Cygnus-Lyra constellations in the northern sky, to find earth-size planets beyond our solar system. Some ground and space missions also work together for detecting new worlds. But countries can not continue their researches without managing and optimizing their investigations. One of the most important ways to reducing costs is detection of those regions of sky that have more chance to finding earth-like planets. Our scientific and technical capability is of course important in the detection of such planets; but technological readiness is not the overall concern of this project. The primary goal of this work is to provide a map showing detection probability of stars throughout the Milky Way that fall in the Galactic Habitable Zone and could potentially host planets conducive to live. We suggested this map on microlensing method previously, and now we propose a new way to measurement this map independent to exoplanets detection methods, such as microlensing, transit or radial velocity. Today, fractals roles are so critical, especially for modeling or analyzing complex systems and fractals structures and also fractals dimension(s) can help us to find type(s), pattern(s) or physic(s) of the systems. Ever since the first planet outside the solar system was found in the early 1990s, a number of questions have been existed, such as "Is there any stellar systems like ours or the solar planetary system is unique?" Fractals are tools for answering this question. In this way, we surveyed thousands of sun-like stars and any stars which had potential to making an earth-like planet in a habitable zone. This analyzing had shown the first fractal structure of new worlds that help us to calculate dimensions of fractal and then predict our chance to find them. Type of stars, metallicity and distance from Galactic center are some important parameters to measuring star fractal dimension. These results provide a new 2-D map of earth-like planet existing probability in the Milky Way disc.