## 59th International Astronautical Congress 2008

## 37th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4.) SETI I – SETI Science and Technology (1.)

Author: Ms. Maryam Tabeshian Iranian Space Agency, Tehran, Iran, maryam\_t5@yahoo.com

Mr. Karan Molaverdikhani Sharif University of Technology, Tehran, Iran, karanmlv@yahoo.com

## MAPPING THE PROBABILITY OF MICROLENSING DETECTION OF EXTRA-SOLAR PLANETS

## Abstract

The growing rate of increase in the number of the discovered extra-solar planets which has consequently raised the enthusiasm to explore the universe in hope of finding earth-like planets has resulted in the wide use of Gravitational Microlensing as a planet detection method. However, until mid-February, only 6 out of the overall 276 discovered exoplanets have been detected through Microlensing, a fact which shows that this method is relatively new in the detection of extra-solar planets. Therefore, preparing a map of the sky which pinpoints the regions with higher probability of planet detection by this method and is drawn based on the available equipments and other regional factors would, indeed, help speed up the discovery of exoplanets.

Detection of exoplanets depends on a number of factors which can broadly be put into two categories: source and lens properties, and technological equipments.

The former is defined by the region of the sky under study, the distribution of stars and interstellar gas and dust, spectral type and the age of the source as well as the mass of the lensing object and the separation and mass ratio of the lensing star and its accompanying planet, the distance between the observer to the lens and the background light source, inclination of the intervening stellar system to the line of sight and the duration of transit and other impact parameters; while the latter is limited by factors such as seeing conditions and technological innovations.

Atmospheric turbulence, light pollution, the strength of optical detectors, the observer's latitude, and data processing methods are parameters which need to be taken into consideration when using ground-based equipments to detect exoplanets.

In order to come up with a sky chart mapping the regions with higher probability of the Microlensing detection of extra-solar planets, one must consider all the above-mentioned factors simultaneously. In this paper, we intend to examine these regions while studying the possible ground-based observatories and potential areas on Earth which can be put into use in the search for planets.