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.)

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EXTENDED IRAS-BASED WHOLE-SKY UPPER LIMIT ON DYSON SPHERES AND THE IMPLICATION FOR FUTURE DYSON SPHERE SEARCHES

Abstract

A Dyson Sphere is a hypothetical construct of a star purposely cloaked by a thick swarm of broken-up planetary material to better utilize all of the stellar energy flux. A clean Dyson Sphere identification would give a significant signature for intelligence at work. An earlier search has now been extended to a sample of more than 1500 sources drawn from the extended Calgary Low Resolution Spectrometer data set. The Calgary data is used to search for fits to blackbody spectra. Searches have been conducted for both pure (fully cloaked) and partial Dyson Spheres in the blackbody temperature region $100 < T < 600$ ^{o}K. Most sources can be linked to other infrared stellar signatures that resemble a Dyson Sphere. When these signatures are used to eliminate sources that mimic Dyson Spheres very few candidates remain and even these are ambiguous. Upper limits are presented for both pure and partial Dyson Spheres. The sensitivity of the LRS was enough to find solar-sized Dyson Spheres out to 400 pc, a reach that encompasses more than a million solar- type stars. The utility of extending this search by using other databases such as 2MASS and the Spitzer GLIMPSE survey will be discussed. The relationship of this search to other ETI searches will be reviewed.