

SPACE DEBRIS SYMPOSIUM (A6)
Measurements (1)

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OBSERVATIONS IN THE THERMAL IR AND VISIBLE OF DRIFTING OBJECTS IN LIBRATION
ORBITS AROUND THE WESTERN STABLE POINT**Abstract**

There exists a population of defunct satellites in the geo-stationary arc that potentially pose a hazard to current and future operational satellites. These drifting, non-station-kept objects have a variety of ages and sizes, and are trapped in libration orbits around the Earth's two gravitational potential wells.

The non-spherical nature of the Earth gives rise to two geo-potential wells or "stable points" that affect objects in geostationary and geosynchronous orbits. The existence of the two stable points (Eastern at longitude 75 E, Western at 105 W) causes active satellites to perform E-W station-keeping maneuvers to maintain a constant longitude. Non-station-kept objects will be gravitationally attracted to the closest stable point, and will oscillate about the stable point.

We have observed several of the approximately 45 objects in libration orbits about the Western stable point*. We have carried out an observation campaign utilizing the Broadband Array Spectrograph System (BASS), as well as with several optical sensors to collect data on a representative sample of these objects, at a variety of solar phase angles. We collected data in several wavebands, and at different temporal resolutions. We describe our methods, the data collected, our results, and our future plans.

* Choc, R., Flohrer, T., and Bastida, B., "Classification of Geosynchronous Objects," Issue 13, ESA/ESOC, February 2011.