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# WISE THERMAL IR OBSERVATIONS OF IDCSP SATELLITES

**Abstract**

The Initial Defense Communications Satellite Program (IDCSP) comprised a series of communications satellites launched into sub-geosynchronous orbit between 1966 and 1968. They are some of the oldest satellites in the geosynchronous (GEO) regime. These were 0.86-m diameter 26-sided polygon spin-stabilized satellites covered with solar panels. There were no batteries or attitude control systems. The population was largely but not entirely identical. We report on observations of these satellites with the Wide-field Infrared Survey Explorer (WISE) satellite which conducted a four-band infrared survey of the entire sky between January and October 2010. In the WISE images are observations of every one of these satellites. They are marginally detected in the two shorter wavelength WISE bands (3.4 and 4.6 microns) where the flux is dominated by reflected sunlight. This result is not surprising, since these are some of the faintest objects at visible wavelengths in the public catalog, and the WISE observations were obtained at a phase angle of close to 90 degrees. The IDCSPs are better detected in the two longer wavelength WISE bands (12 and 22 microns) where the flux is dominated by thermal emission from the satellite. At 12 microns the magnitude distribution is very sharply peaked near 6.3. We report on the thermal IR magnitudes and colors of these inactive satellites and compare them with thermal IR magnitudes and colors of other objects in the GEO regime, including active station-keeping cylindrical and box-wing satellites, Breeze-M and Titan rocket bodies, and Titan rocket body debris.