

Equatorial Occultation Densification and JPL's BlackJack GPS Receiver

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Abstract

All presently flying or approved GPS occultation missions feature polar or near-polar orbits, generally greater than 70 deg inclination. This, unfortunately, provides the sparsest coverage at the equator, which is of the greatest importance for weather and studies. A single equatorial orbiter can add 500 or more equatorial samples each day, nearly doubling the number available from a 6-satellite polar constellation. This presentation will briefly summarize the benefits of adding an equatorial orbiter to the currently planned mission set, and will describe in detail JPL's BlackJack GPS occultation receiver. The BlackJack is now flying successfully on CHAMP and SAC-C. It will soon fly on the two GRACE satellites, and has been selected for flight on the COSMIC constellation. Specifics to be discussed include, size, mass, power, data rates, interface specifications, antennas, and spacecraft accommodation requirements for a successful occultation mission.