

Technical Status

IBEX State of Health

IBEX State of Health (SOH) is nominal. In-depth subsystem trend analysis over the entire mission has been performed in 2010, 2012, 2015 and 2016. Each month, spacecraft bus SOH telemetry is trended over the past month and over the entire mission. These monthly reviews and formal quarterly reviews show no change in thermal trends or subsystem performance. No updates are needed to operational settings or alarm limits, degradation is less than pre-launch predicts and nothing in the trending precludes another decade of operations.

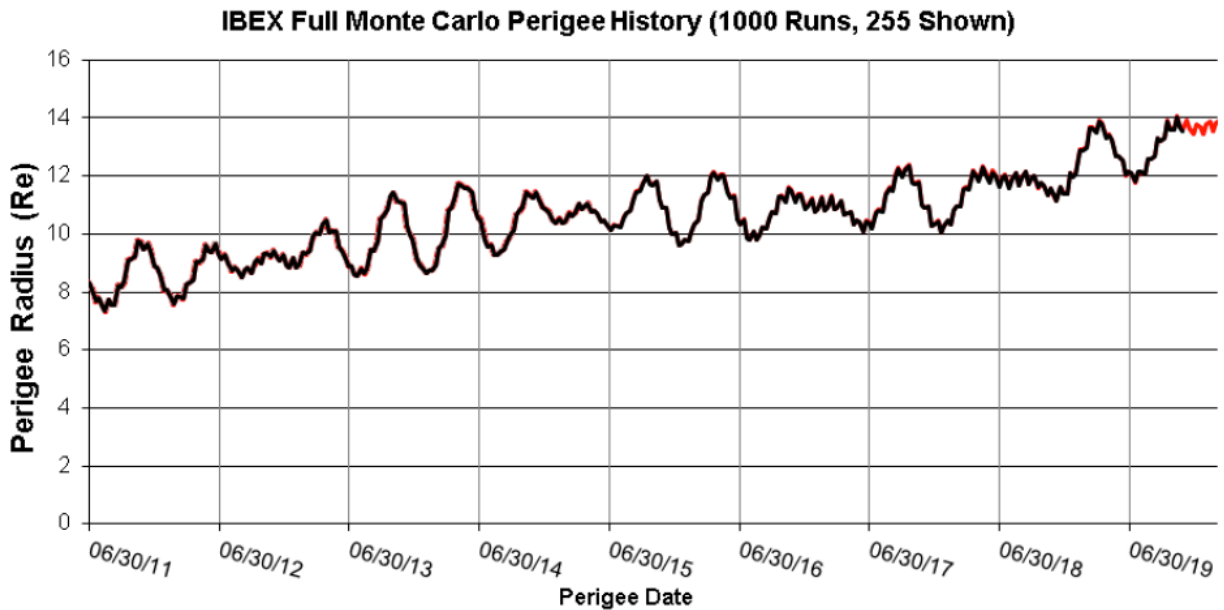
Item	Status	Comments
Instrument Health	G	Nominal = No change in thermal trends or subsystem performance. No change needed to operational settings or alarm limits. Degradation less than pre-launch predicts. Nothing in trending precludes another decade of operations.
IBEX-Hi	G	Nominal
IBEX-Lo (TOF & IFB)	G	Nominal
IBEX CEU	G	Nominal
Spacecraft Bus Health	G	Nominal
ACE, Star Tracker	G	Nominal. Star Tracker software updated in 2016.
EPS, Battery, Solar Array	G	Nominal. Eclipse frequency and duration minimized by 2011 transition to cis-lunar orbit.
Propulsion, Hardware	G	Nominal
Propulsion, Hydrazine	G	Enough hydrazine for more than a decade of nominal pointing/spin control maneuvers and eclipse mitigation, if necessary. Pressure linearly decreasing at ~0.5 psi/year. 106 psi at end of 2019: 100 psi = empty.
C&DH, RF Comm	G	Nominal
Ground Segment Hardware	G	Three fully redundant command/archive strings. Additional offsite archive at Northrop Grumman, SwRI and UNH.
Staff & Training	G	A few personnel changes in operations team have been preceded by appropriate mission familiarization and training.

IBEX Risks

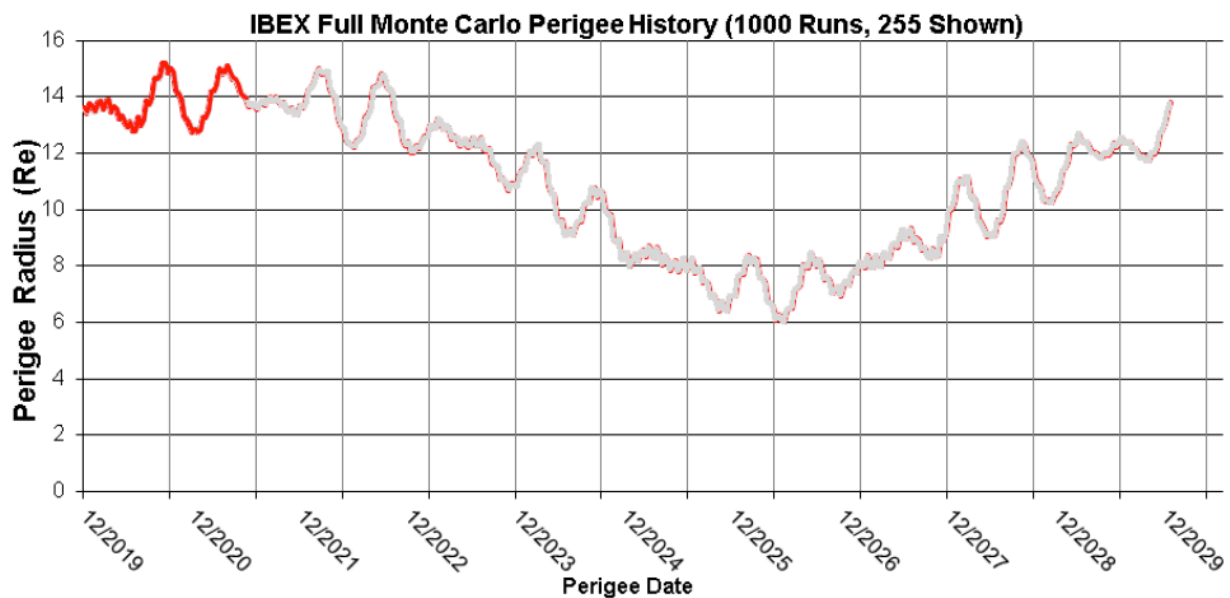
IBEX currently has no open risks.

IBEX Orbit

IBEX pioneered a new class of highly elliptical self-stabilizing lunar-synchronous orbits. The figures below show the 2019 Monte Carlo trajectory analysis for the perigee and apogee altitude. The top figure shows the definitive ephemeris (black) plotted over the baseline 2011 trajectory predicted ephemeris (red) which was performed 2 months after entering the lunar-synchronous orbit. The bottom figure shows the 2019 10-year predict (grey) plotted over the original long term predict (red). The long-term predictions continue to agree remarkably well.



Comparison of 2011 predict with definitive orbit



Comparison of 2011 predict with 2019 10-year predict