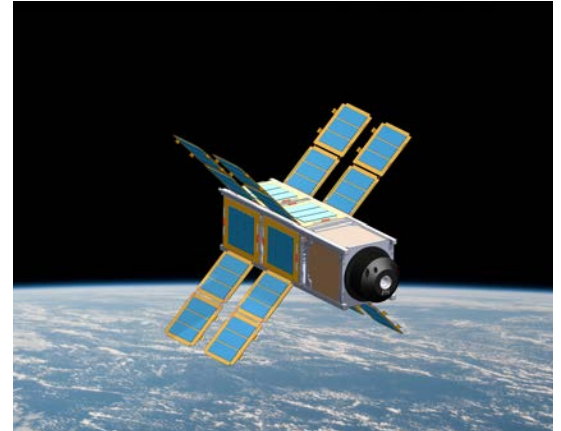


# PHASEFOUR

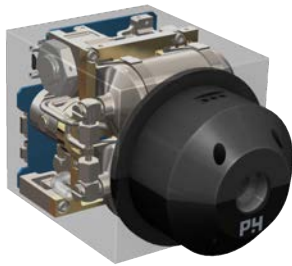
CASE STUDY: REMOTE SENSING AT LOW ALTITUDES

## OBJECTIVE: LIFE EXTENSION FOR A CUBESAT EARTH OBSERVATION MISSION

The 3U cubesat is launched into a 550 km sun-synchronous orbit. Following separation and deployment, the satellite performs a 48 hour retrograde burn to lower its altitude to 300 km. This orbit-lowering maneuver costs approximately 780 N-s of impulse, leaving 1720 N-s for lifetime extension. With a 3 minute burn each orbit, RFT can keep the 3U satellite at 300 km for approximately 6 months. For comparison, a 3U satellite without propulsion would de-orbit within 15 days.

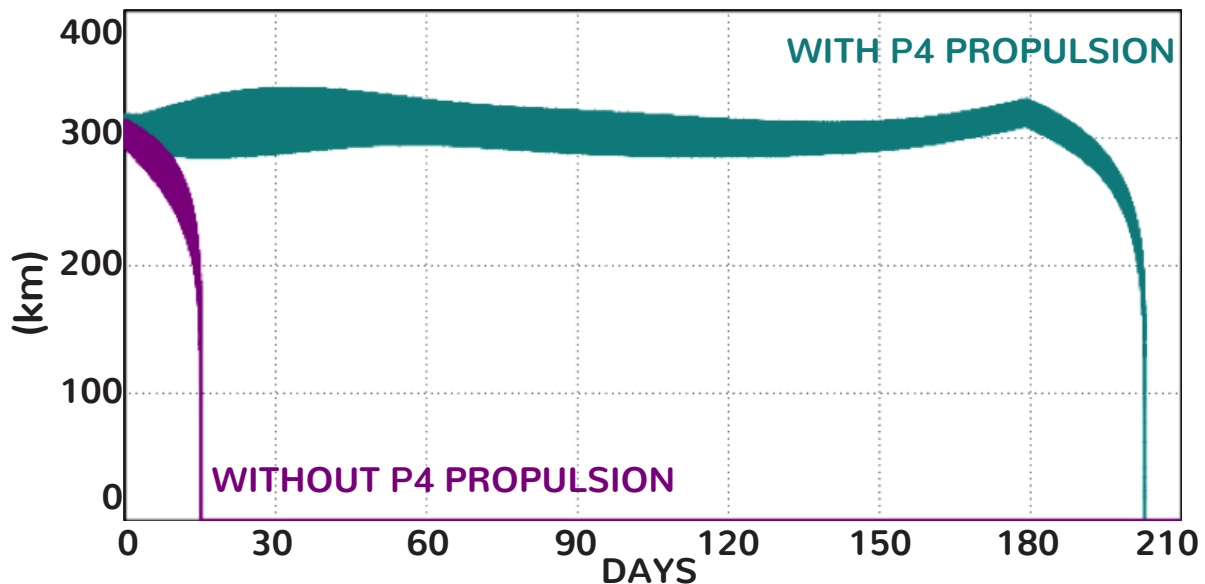


## SATELLITE PROFILE



<b>PAYLOAD</b>	Imager
<b>SATELLITE SIZE</b>	3U
<b>THRUST</b>	4.5 mN
<b>TOTAL IMPULSE</b>	2,500 N-s
<b>XE PROPELLANT MASS</b>	500 g

## RESULTS: 13X LIFETIME INCREASE



**PERTURBATIONS:** DRAG, EARTH OBLATENESS, EARTH GEOPOTENTIAL, SOLAR RAD. PRESSURE, SUN/MOON GRAVITY  
**ASSUMPTIONS:** NRLMSISE-00 atm. MODEL, SOLAR RADIO FLUX: 150, AVG. CROSS-SECTIONAL AREA: 750 cm<sup>2</sup>