SDSU RadSat

Shaan Heugly, Dalton Williams, Zachariah Fischer, Jamie Lynn Blockey, Trevor Allen
San Diego State University | College of Engineering: Aerospace

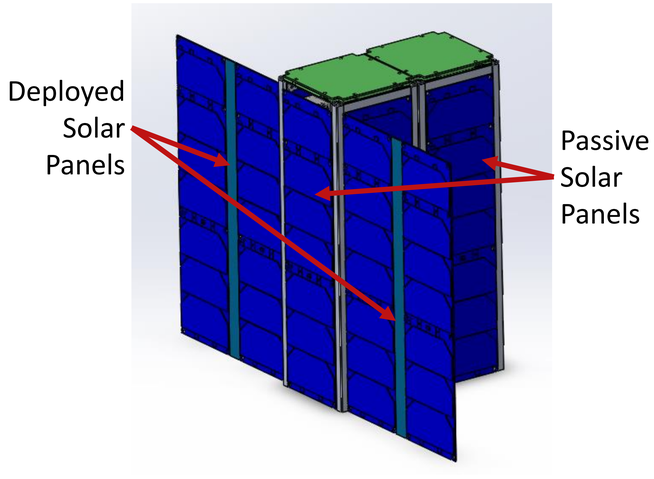
Abstract

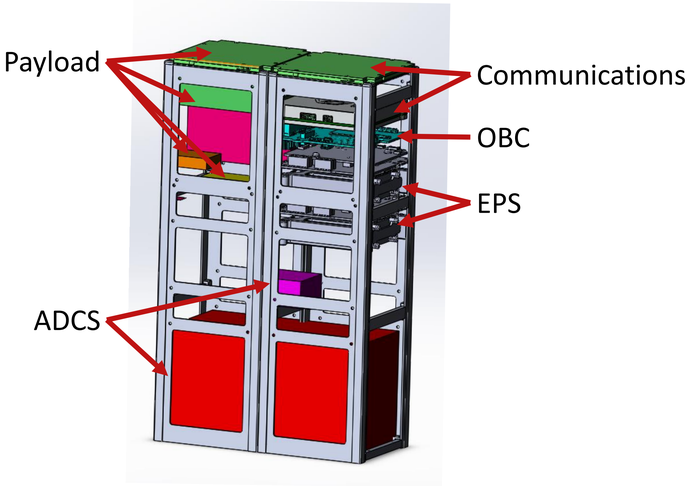
SDSU RadSat functions as a test bed to allow companies to fly their hardware to a radiation-rich environment and test this equipment's durability in space. This allows the companies to sell their products as a "Flight Proven" or Technology Readiness Level 9 component. This increases the likelihood that a customer will purchase this component, and in the case of component failure, the manufacture can redesign without crippling a customer's satellite.

Mission Objectives

- **Primary**
  - Achieve and maintain SSO orbit
  - Fully deploy solar arrays
  - Receive nominal communication from satellite
  - Monitor payload and verify readiness level of components
- **Secondary**
  - Ensure payload lasts for the mission's two-year life span
  - Achieve nominal articulation in relation to the sun for max solar efficiency
  - Successfully deorbit satellite at end of life

RadSat Overview





Communication

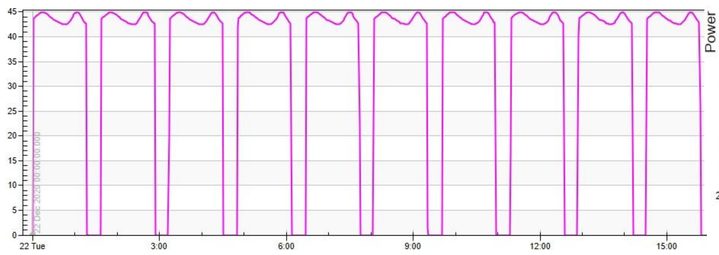
SDSU RadSat will be operating in the S-band frequency range in order to ensure efficient and reliable communications. RadSat will utilize the TDRS system along with the ground station at NASA White Sands. RadSat also possess a contingency mode which orients our antennas down towards the Earth's surface in the event of our connection with TDRS goes down.

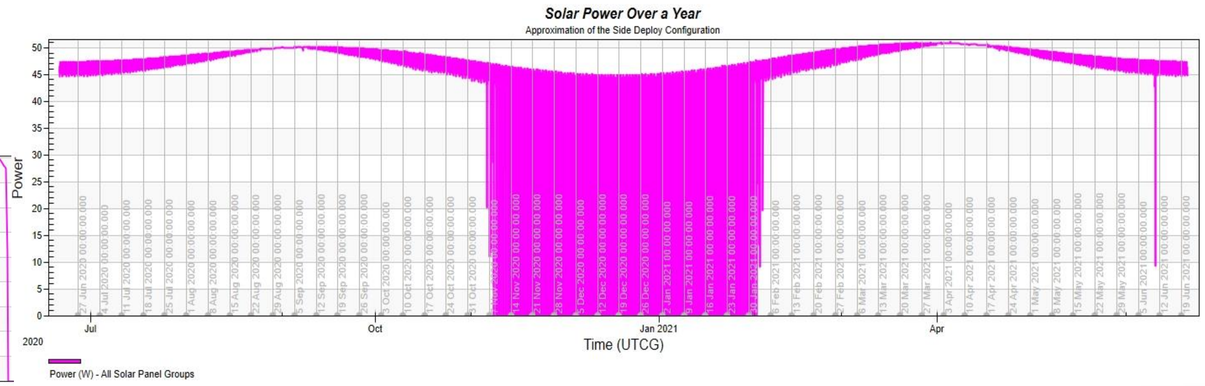
Orbit & Attitude Determination

SDSU RadSat will be launched into a circular sun-synchronous orbit 600 km from earth using SpaceX rideshare program. RadSat will utilize three momentum wheels placed along the x, y, and z – axis. A redundant liquid propulsion system will be implemented in RadSat for ADCS, orbit stabilization and deorbit.

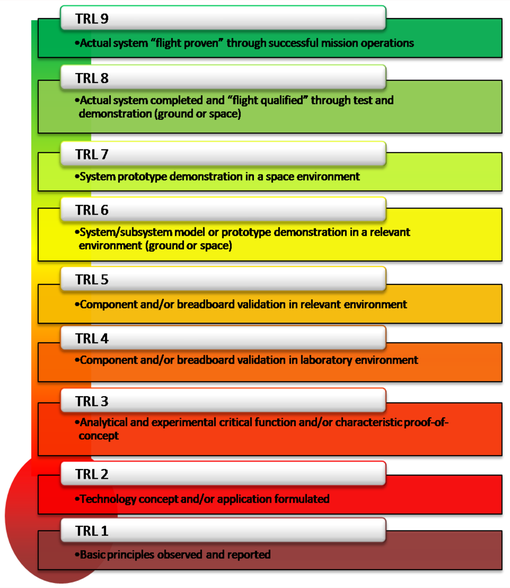
Power

Power is generated by an array of solar panels with 29.5% efficiency with each panel capable of producing 16.31 V in ideal conditions. This power is then stored in two ISIS space iEPS battery packs capable of storing up to 90 Wh of energy for use during eclipse and contingency operations.

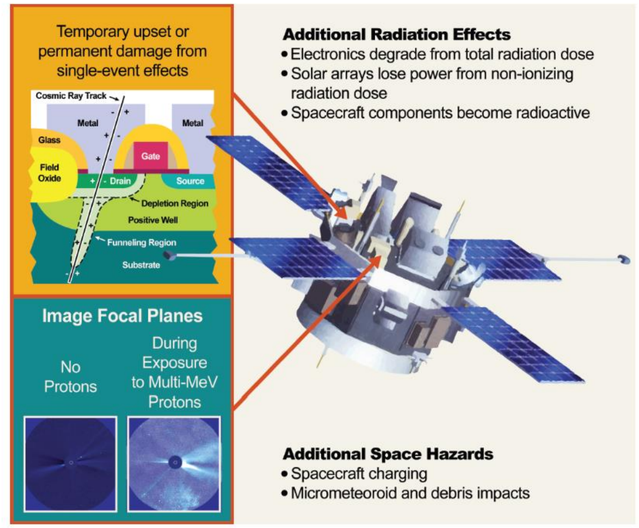




Technology Readiness Level (TRL)



Radiation Effects



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