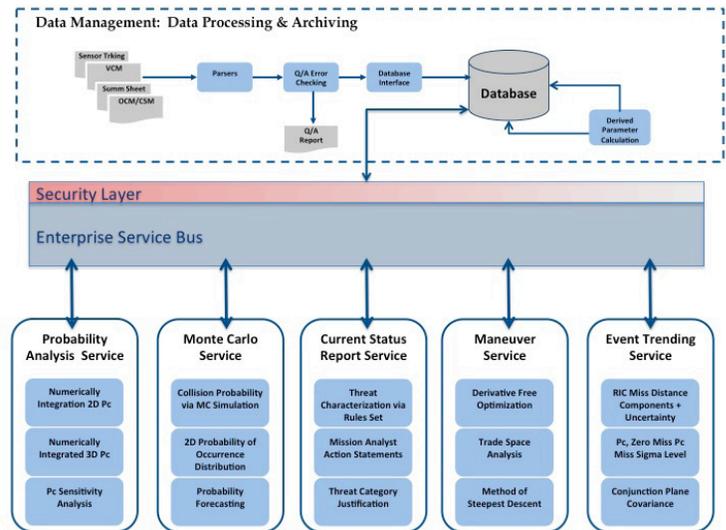


# Space Situational Awareness - Collision Threat Characterization

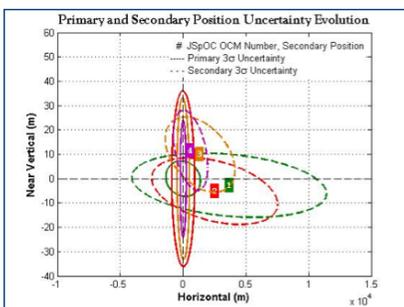
Operational collision risk management is now an essential component of space mission operations. Most spacecraft operators have some semblance of a process to evaluate and mitigate high-risk conjunction events. As the size of the space object catalog increases, satellite operators will be faced with more conjunction events to evaluate. SpaceNav's Collision Risk Management software enables spacecraft operators to analyze & qualify high interest conjunction events. The software tools produce various figures and graphs, which aid in analyzing the event data.

## SpaceNav Collision Risk Management KEY FEATURES

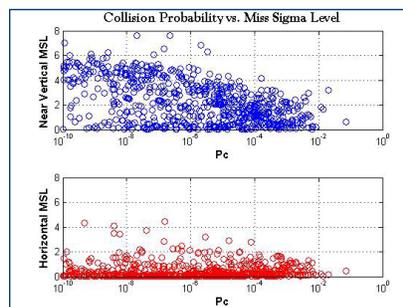
- Collision probability analysis tools
- Event trending & forecasting
- Database storage and archiving
- Rules-based approach to threat characterization
- Automated status report that provides 'action statements' to be carried-out by mission stakeholders
- Flexible, modular design that easily allows for integration with other tools and ground systems



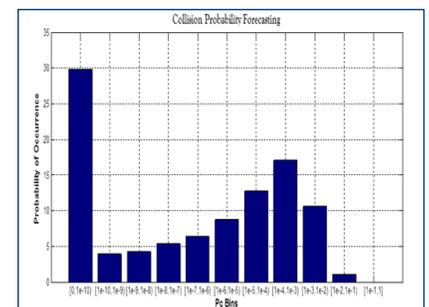
Quantifying the collision threat involves computing the collision probability, estimating how the probability will evolve, and trending various event parameters to establish consistency among solutions.



Conjunction plane covariance trending establishes the consistency between orbit solutions. The Horizontal – Near Vertical (H-NV) directions remain invariant over the course of a conjunction event. Worst-case probability analysis is performed in this frame to determine a least upper bound on the collision threat.



SpaceNav's covariance screening methodology utilizes a miss sigma level (MSL) metric. The MSL is the ratio of the separation distance to the combined position uncertainty. A MSL less than 6 is a necessary condition for a high interest conjunction event. The MSL is used to identify both current and future high probability events.



SpaceNav's forecasting algorithm employs a Monte Carlo approach when estimating how the collision probability will evolve. A distribution of possible probability values is generated in order to determine the probability of occurrence for a given risk threshold.