

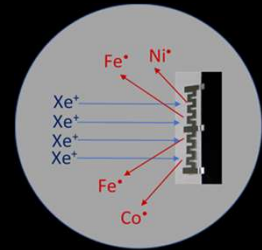
Space Technology Mission Directorate Game Changing Development Program ACO Diamond-like Coating Assessment for Reduction of Thruster Erosion (DCARTE)

Project Overview

To validate a novel, lightweight coating material for reducing electric propulsion thruster plume erosion of solar array interconnects with the goals of increasing reliability and decreasing cost.



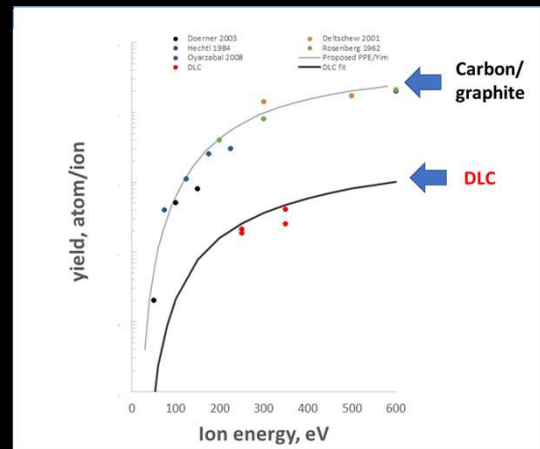
Artist's Drawing of
Deep Space I with
Solar Electric
Propulsion (NASA
JPL)



Xe Ion Sputtering of
Kovar Interconnect
(NASA GRC)

Technical Approach

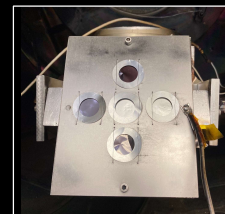
Sputter erosion of diamond-like coated (DLC) Kovar was compared with state-of-the-art (SOA) room temperature vulcanized (RTV) CV-1142 silicone using a Xenon ion source operated at selected energies and arrival angles. Results indicate that the sputter erosion of DLC is significantly less than SOA.



Preliminary data suggests that DLC has a lower Xe ion sputter erosion rate than carbon or graphite which has one of the lowest known sputter erosion rates (Maxar)

Contributing Partners and/or Infusion Plans

Maxar Technologies, partner in the Announcement of Collaborative Opportunity (ACO), has a strong interest in replacing the SOA coating with DLC to reduce labor, mass, production time and increase life. Maxar estimates \$500,000 production cost savings annually.



Diamond-Like
Coating on Kovar
Samples in Vacuum
Chamber (NASA
GRC)



Xe Ion Beam
Impinging on
Diamond-Like Coating
on Kovar Samples in
Vacuum Chamber
(NASA GRC)