

Belstead Research Ltd; Proof Of Concept For Detumbling Of Debris By Laser Ablation For Active Debris Removal

Project Summary

Active debris removal is made significantly more difficult by the rotation of unco-operative targets. Detumbling the targets is a difficult problem which requires very precise control. The suitability of laser ablation for this task, potentially providing a technology spin-in from terrestrial laser applications, has not been assessed in the open literature. This could be an attractive solution as the technology is mature, contact with the target is not required and lasers have the capability to be extremely precise. Added to this, the ablation process is sufficiently rapid that the state of the surface is not influential, and as active debris removal spacecraft operate at relatively low distances from the target, high power lasers are not expected to be required to provide the necessary forces for detumbling.

This project will determine the feasibility of using laser ablation for debris detumbling in active debris removal missions, and the system requirements of mass, power, energy and location of incorporating such a laser system on an active debris removal spacecraft.