

# Multi-kW High Beam Quality CW Laser for Space Debris Manoeuvring

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The Cooperative Research Centre for Space Environment Management (SERC) and its participants, are developing a system to demonstrate remote manoeuvre of space debris using photon pressure for active collision avoidance.

To manoeuvre a space object the experiment plans focus a high power laser onto a debris target. A high order adaptive optics (AO) system will be employed to compensate divergence of the laser caused by atmospheric turbulence. However, the laser needs to originate with high beam quality for the AO system to be effective.

SERC and EOS Space Systems are developing a laser for this application. To achieve the necessary laser power a multi-beam laser that combines the power from four 2 kW laser amplifiers is being constructed. The beams are combined by spectral combination using Volume Bragg Gratings.

This paper will describe the development of the laser and the steps taken to ensure that both high power and excellent beam quality are achieved.