

Description of the Extremely Low Resource Optical Identifier (ELROI) Experiment on NMTSat

The Extremely Low Resource Optical Identifier (ELROI) experiment tests a method for optical identification of small satellites. It will allow light from a pulsing laser diode, to pass through a diffuser which spreads the light emissions in a hemisphere. Like a lighthouse, the pattern of pulses will uniquely identify the source of the light.

There are two diffuser lenses on opposite surfaces of the spacecraft, with two diodes per diffuser. Each diode consumes only 0.15 mW, hence the reference to extremely low resource requirement.

The main components of this experiment, which mass 160 grams total, are:

A printed circuit board with diodes, data processor, power system and 4 connectors

A 6061 aluminum tube 2.5 cm square x 8 cm length, with 2 end plates

2 borosilicate glass lenses 2 cm diameter x 2 mm thick

For this experiment, the pulses will be observed by a dedicated telescope at Los Alamos National Laboratory in Los Alamos, New Mexico, USA.

The emissions pose no hazard to observers. A typical amateur telescope on earth would receive only a few photons per second from ELROI.