

I. Laser Configuration Description

Laser Installation

The laser beam is broadcast out of the viewing slit of the Shane 120-inch telescope dome. The beam is parallel to the optic axis of the telescope and separated from the axis by a distance of 2.5 meters. The layout of the laser system is shown schematically below (Figure 1). The laser is located in a temperature-controlled room with support equipment on the second floor of the telescope dome. Optical fibers connect the laser to the laser launch telescope enabling the laser beam to follow the telescope axis without complex pointing equipment. Diagnostics are mounted directly on the barrel of the telescope. The beam is expanded to a diameter of 25 cm using a refractive telescope and projected out of the dome slit.. The output laser beam has an average power of ≤ 12 Watts and is completely enclosed in tubes until the final large lens of the launch telescope. Both the laser and diagnostics tables have enclosures so that personnel are permitted within the dome during normal operation.

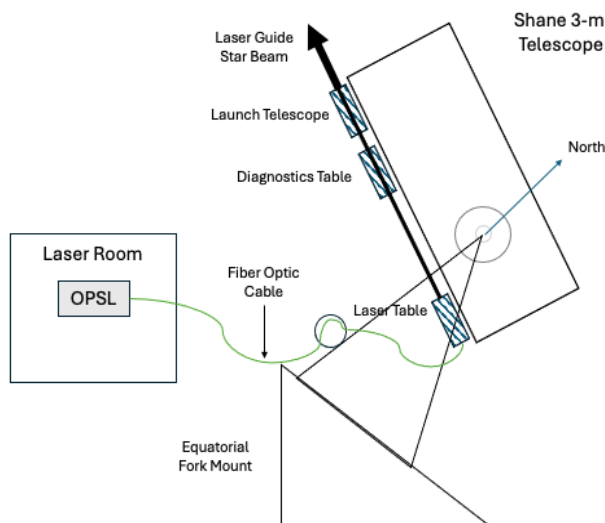


Figure 1: Schematic of the laser, launch telescope, and 120-inch telescope.

Laser Description

The laser system for Lick Observatory consists of an Optically (diode) Pumped Semiconductor Laser (OPSL) produced by Areté. The frequency of the laser is tuned to the sodium resonance line of 589 nm. The laser is continuous wave (CW) laser with a maximum average output power of 12W. The laser beam is expanded to a diameter of 25 cm before it exits the dome and the divergence is close to the diffraction limit for collimated beams at 2 microradians. This beam is not eye safe for all normal aircraft altitudes and special procedures must be in place to detect aircraft and close the beam if an aircraft approaches. The laser system is totally contained within the Shane telescope dome. The operation of the laser system is under computer control by an

operator in the telescope control room. A full complement of safety systems is incorporated into the laser facility, conforming to DOE, state, and local regulations.