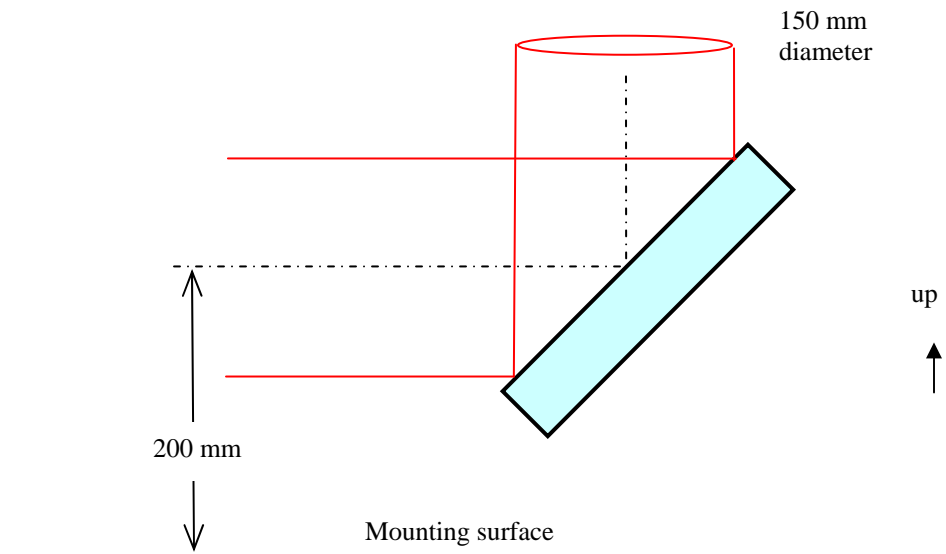


OPTI 523 – Optomechanical Design and Analysis

Problem 4: Medium sized fold mirror

Choose a mirror and design a mount to fold a 150 mm diameter collimated beam of light from a Nd YAG laser.



Requirements:

150 mm nominal beam diameter

90° reflect the beam from horizontal (on the bench) to vertical.

(an *in situ* alignment test is provided that achieves 1 arcsec accuracy)

< 30 nm rms wavefront error

> 90% reflectance at 1.06 μm

Operational temperature 10° - 20° C with changes < 2°/hour

Adjustable to 10 μrad resolution

Alignment stable to 20 μrad over operational temperature for 8 hours

Alignment stable to 50 μrad long term

Resonant frequency > 50 Hz

Assume that the mirror and mount will be assembled and tested, then shipped to site.

You will need a method of making the fine adjustment.

You will also need a course adjustment that gets you within the range of the fine adjustment.

You need to identify or design any special tools needed for the assembly.