
NIRSPEC

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NIRSPEC Cryomechanics Design Note 04.00 Vacuum enclosure

Introduction

The vacuum enclosure design is dictated first of all by the size of the instrument it has to contain. We have already decided to build the instrument with the optical plate at the bottom attached to the “lid” and the rest of the vacuum system lifting off as a unit. The precise size of the internals of the instrument is not yet fixed, but is close enough that we have been able to calculate the stresses and strains in the walls and joints. The material for the walls will be 6061 aluminum, Heliarc welded. The wall thickness will be $\frac{3}{4}$ ”. Since the top and bottom covers are the largest pieces and therefore have the most stress from atmospheric pressure, we will make the top cover of the box a separate piece with an O-ring seal, as well as the bottom plate. We will most likely never remove the top plate.

What next?

The remaining work is to actually draw up the whole enclosure. The window mount is dealt with in a separate document (NCDN06). A section on the placement of vacuum feedthroughs, CCR head and electrical connectors can be added as they are decided.