

Solar B - EIS

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EIS Field of view & Exclusion Zone

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1. INTRODUCTION

This document describes the field of view for EIS and defines exclusion zones for other spacecraft items to protect the instrument from debris and contaminants.

2. EIS FIELD OF VIEW & EXCLUSION ZONE

The EIS instrument views the Sun through a front aperture at the end of a rectangular baffle tube. This baffle tube extends sunward beyond the thin aluminum filters. The angular size of the sun is 0.5 deg, and the baffles and aperture openings are sized to accommodate this angle plus a 2mm margin all around.

EIS Front Aperture - Looking into Instrument from +Z

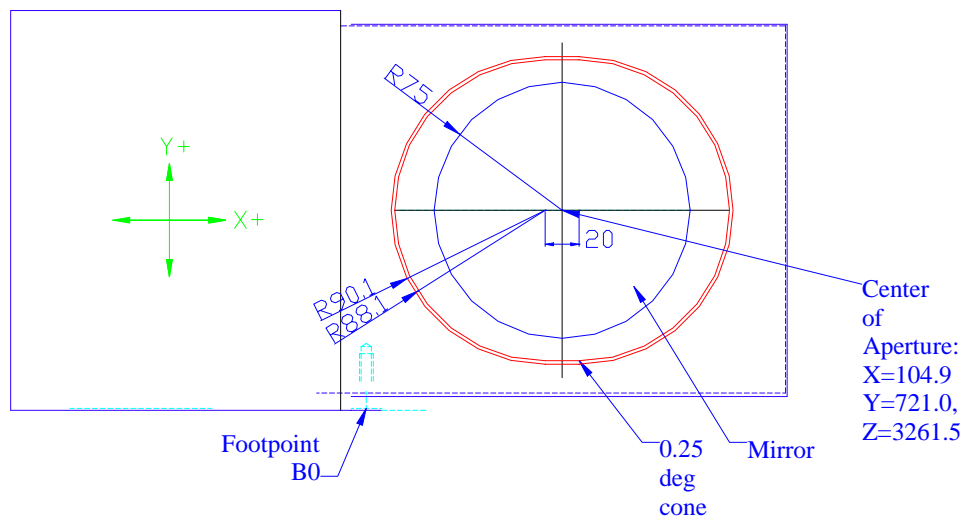


Figure 1. EIS Entrance Aperture

The front aperture is actually an oval to accommodate the ± 10 mm X translation of the primary mirror, but is assumed to be circular here for simplicity and to be 200.2 mm in diameter.

While the Sun only occupies a 0.5° cone angle, the front portion of the baffle tube serves to protect the thin aluminum filters from micrometeorites, orbital debris, and contamination. The most likely

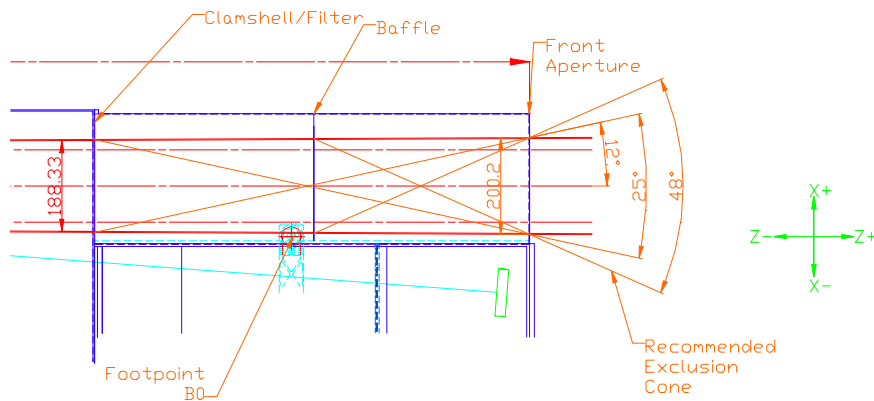


Figure 2. EIS Baffle Tube and Exclusion Zone.

source of contamination or damage is from components of the Solar-B spacecraft itself. Outgassing from warm surfaces and particulates such as paint flakes will be very damaging to the filters. For this reason, the front baffle tube has been designed so that the filters have no direct line of sight to other components of the spacecraft. In the present design, there is a light baffle midway between the filter and the entrance aperture. A zone of exclusion in front of the EIS aperture is configured in front of EIS such that no straight-line path within this zone can reach beyond the middle baffle. Such an exclusion zone has a full angular extent of 48° about the S/C Z direction. The entrance aperture center point location in S/C coordinates and footpoint B0 are given in S/C coordinates in Table 1. The coordinates of B0 are as supplied by the System (see file *fairing.pdf* from H. Hara dated 1/18/00), and the EIS aperture has been calculated from this point, should B0 move, the EIS aperture will move with it.

Table 1. Location of EIS Entrance Aperture.

S/C Coordinate	Footpoint B0 (mm)	Center of EIS Aperture(mm)
X	0.0	104.9
Y	605.0	721.0
Z	2767.8	3161.5