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| L.A.M. UMR 6110 | HERSCHEL SPIRE SMECm | Ref : SPI.PFM.00.RI.01.A Author : P. Dargent | Page : 1 / 6 Date : 03 October 2001 |
| Définition des Interfaces Interface Control Document | | | |

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Update

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1. Scope

This document defines interfaces between master assembly of SMEC mechanism and SPIRE structure

2. Documents

Applicable Documents

AD1 : SMEC mechanism Enveloppe and Interfaces drawing (SPI-PFM-00-DI-01-A / P. Dargent / October 2001)

AD2 : Structure ICD drawing (ja1-5264-909 v2 / AJC / 09-03-2001)

AD3 : Structure ICD (SPIRE-MSS-PRJ-000xxx v1.0 / B. Winter / April 2001)

Reference Documents

RD1 : Masse Breakdown of SMECm (SPI-PFM-00-LB-01-A)

3. Geometry

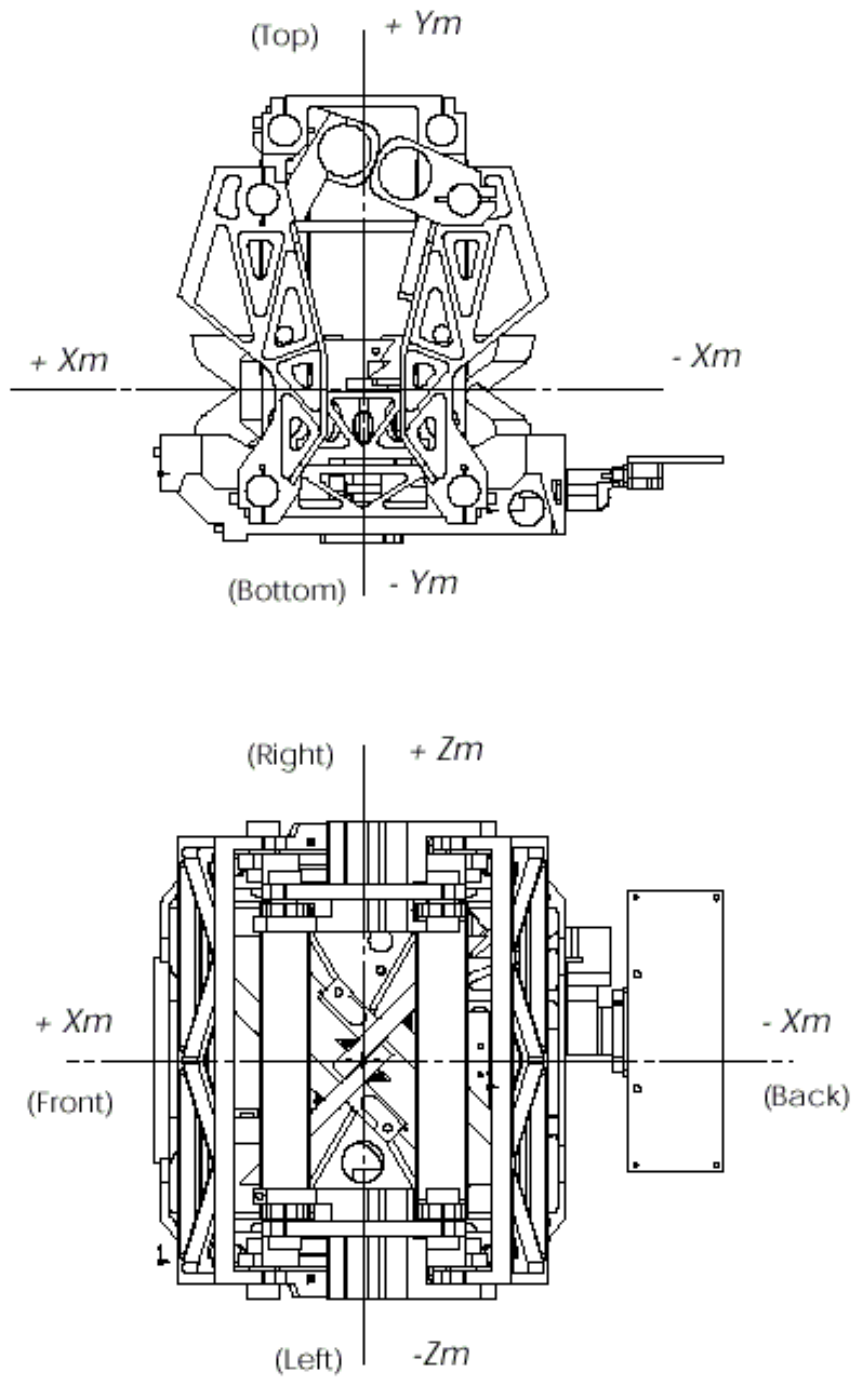
SMECm coordinates system (X_m, Y_m, Z_m) is centered in beam plane, at center of symmetry.

This origine corresponds to the top of both cube corner mirrors when they are positionned at $OPD = 0$ (Optical Path Difference = 0)

X_m axis is oriented to long travel of FTS, and parallele to X_u . So, mirrors stroke is from $X_m = -3,2$ mm to $X_m = +32$ mm.

Y_m axis is perpendicular to X_m and to beam plan.

Z_m axis is orthonormal.



4. Masse and CoG

Total masse of mechanism is 1650 gr., plus 10% contingency (that is 1815 g)

Center of gravity , in latched position, mirrors at -8mm, is at :

$X_m = -7,47\text{mm}$

$Y_m = + 1\text{mm}$

$Z_m = +0,54\text{ mm}$

This masse doesn't take into account cube corners mirrors, nore harness and it's structure

5. Resonances

Preliminary FEA shows that five first eigen frequencies of the latched mechanism are about :

- $F_1 = 202\text{ Hz}$
- $F_2 = 244\text{ Hz}$
- $F_3 = 296\text{ Hz}$
- $F_4 = 431\text{ Hz}$
- $F_5 = 499\text{ Hz}$

6. Structural Interfaces

Base plate of SMECm is fixed to Optical bench by four 10-32UNF x 10 screws at positions defined in AD1 and AD2.

To minimize stress induced by hyperstatic positionning, 4 shims will be placed between SMECm baseplate and Optical bench. Thickness of those shims (nominal thickness 0,2 mm) will be adjusted after precise metrology of interface plane of both SMECm baseplate and Optical bench.

Harness structure will be crewed to optical bench by four 2-56UNF (TBC) screws at positions defined in AD1. No shim will be necessary.

7. Thermal Interfaces

No specific thermal interfaces are required.
Heat of actuator coil is conducted directly through base plate.

8. Electrical Interfaces

All mechanical parts in contact between SMECm and Optical bench are made of aluminum (including shims). Surfaces in contact will be treated with Alodine 1200 process as described in SPI-PFM-00-PM-02-A.

9. Optical Interfaces

Thanks to the choice of cube corner mirrors configuration, alignment of SMECM with optical beam is very loose. No adjustment accessories are required.

Straylight will be minimized by black anodic oxydation (cf. SPI-FTM-00-PM-03-A).