



SPIRE-AST-COM-001919

EADS Astrium

Telefax

+31 362 540 860
SRON, Groningen, NL
C. K. Wafelbakker

+44 1235 44 6667
RAL, Oxfordshire, UK
E. Sawyer, B. Swinyard

089 30 000 3272
MPE, Garching, D
O. Bauer, J. Schubert

Copy to:
+33 4 92 92 3010
Alcatel, Cannes, F
J.-J. Juillet, Ph. Martin

+31 71 565 5244
ESTEC, Noordwijk, NL
Th. Passvogel, D. de Chambure

From:
+49/(0)7545/8-42 43
Name:
Dr. Edgar Hölzle
Department:
Herschel/ED 65
Telefon:
+49/(0)7545/8-3668
E-Mail:
Edgar.Hoelzle@astrium.eads.net
Reference:
HP-ASED-FX-0966-03
Date:
3.12.2003

Subject: LOS knowledge/accuracy

Dear Sirs,

in our alignment sequence our baseline was to measure the instrument positions on the Optical Bench, using a conventional Linear Measurement Device (LMD).

Meanwhile, the revised H-EPLM specification defines a stringent requirement for the relative instrument LOS knowledge (3.6 arcsec) for HIFI and SPIRE w.r.t. PACS which implies a very accurate distance measurement between the instruments. This accuracy cannot be achieved with the a. m. LMD, however.

Therefore, the idea to improve the LOS knowledge is the following:

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EADS Astrium GmbH
An der Bundesstraße 31
88090 Immenstaad
Deutschland/Germany
Telefon: +49 (0)7545 8-01
Telefax: +49 (0)7545 8-4411



From: E. Hölzle
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The instruments' mechanical interfaces are equipped with precise references (e. g. dowel pins or similar, which do not allow lateral adjustment of the instruments).

Therefore, in order to guarantee the precise knowledge of the LOS intercept point of the instruments on the OB, the LOS intercept point has to be determined wrt. the optical reference cube **and** wrt. the dowel pin (otherwise the lateral instrument alignment position on the OB cannot be achieved with the required accuracy, TBC by instruments). Together with a precise knowledge of the dowel pin positions in the OB the overall knowledge of instrument positions can be derived, and from this, their precise distances (and its knowledge) from each other can be obtained without. (see attached sketch)

Therefore, we should t ask you the following:

1. Please, confirm that you will know the LOS interception point location with regards to the dowel pin, for FM instrument, for warm and cold conditions (the latter could be derived from thermo-elastic model).
2. Could you provide us with the LOS interception location knowledge accuracy with regards to optical reference cube (for warm and cold conditions).
3. Could you provide us with the optical reference cube location knowledge accuracy with regards to the dowel pins (for warm and cold conditions, the latter could be derived from thermo-elastic model).

These values will be an input for our alignment budget.

Please confirm that the above requested information will be provided in the frame of your IHDR documents. A quick answer would be appreciated (specifically HIFI is asked to provide the necessary input, since no response to our E-mail of 25. Sept. 03 has been obtained yet).

Kind regards

EADS ASTRIUM

A handwritten signature in black ink, appearing to read "i. V. W. Ruhe".

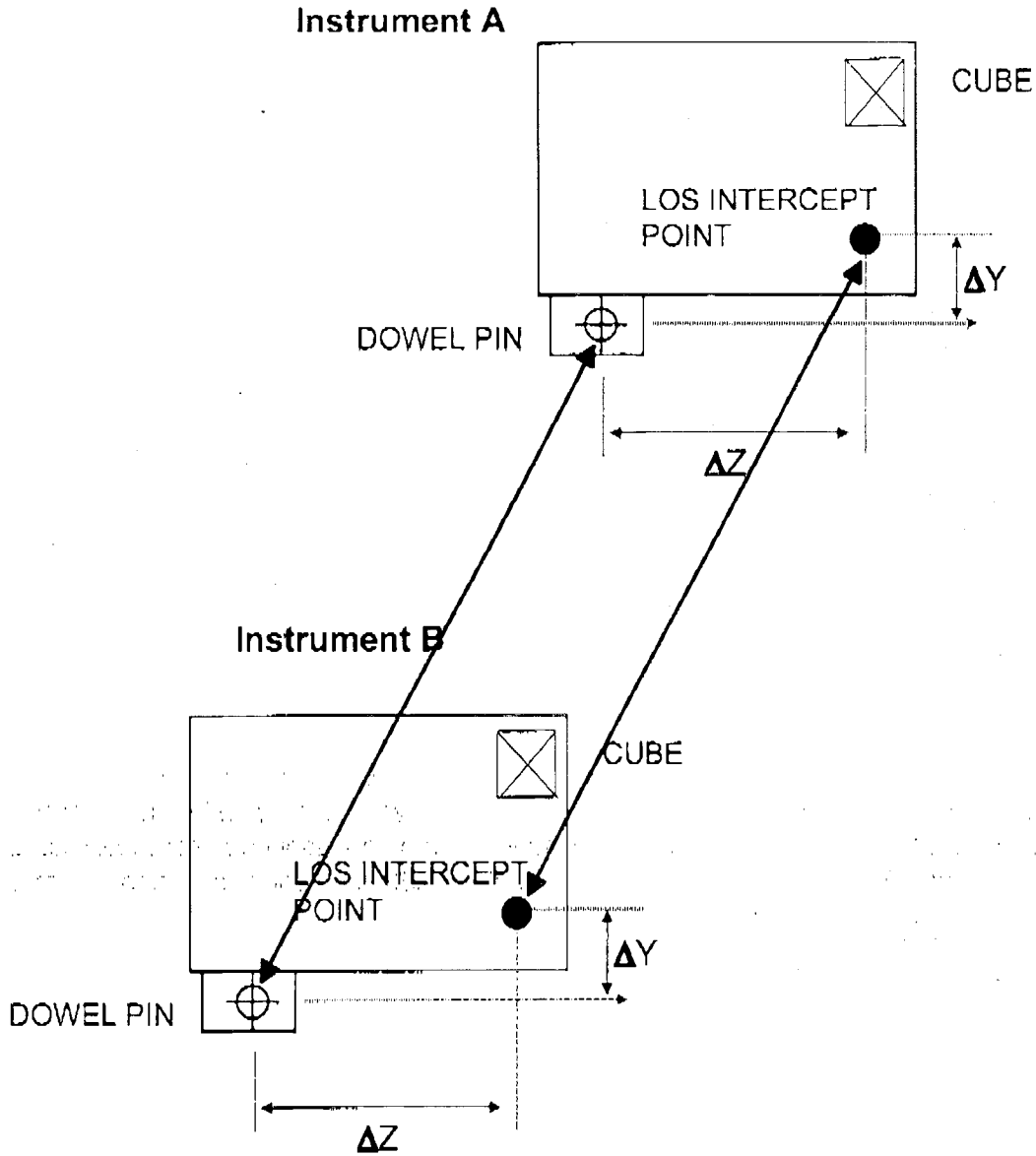
For i. V. W. Ruhe

A handwritten signature in black ink, appearing to read "E. Hölzle".

i.A. Dr. E. Hölzle

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$\Delta Y, \Delta Z$ LOS intercept point to cube and dowel pin: Instrument assessment

Distance of cubes and dowel pins of instr., 1 and 2: Industry assessment
(final result)