SOHO Intercalibration Joint Observing Programme 05

SUMER/CDS INTENSITY CROSS-CALIBRATION

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Progress:

Draft Scheme	From CDS/SUMER Blue/Red Books
Discussion at SICWG	June 13 1994
Detailed Plan	August 10 1994
Distributed to PI Teams	August 11 1994
Minor Revisions	November 4 1994, February 5 1995
Revision	June 23, 1995

Objective: Intensity cross-calibration of CDS and SUMER.

Conditions Necessary to Run: Requires CDS and SUMER operation and a suitable quiet Sun target region anywhere on the disc.

Scientific Case: This scheme should be part of our regular calibration programme - performed on a monthly basis at least. It makes use of common bands between CDS-NIS, CDS-GIS and SUMER. Exposure times are fixed to provide accuracies of better than 10% on the brighter lines. The wavelength overlaps between CDS and SUMER and between the CDS spectrometers are given below (the brighter lines in these ranges are listed):

CDS-GIS/SUMER - 656-785Å: We require bright, well separated lines. In practice, this gives us one line - Ne VIII 770.40Å. However, the band 1524-1564Å gives supplementary information on N IV 765.14Å, Ne VIII 780.30Å.

CDS-NIS/SUMER - 513-633Å: Again, we require bright, well separated lines. The He I 584.33Å, Mg X 609.79Å lines are the best for this use, though they cannot be in the same wavelength band. The bands 1150-1190Å and 1215-1255Å cover these two and will give supplementary information on Mg X 624.94Å.

CDS-GIS/NIS - 308-338Å: Brighter lines - Fe XIII 312.16Å, Mg VIII 313.73Å, Mg VIII 317.01Å, Fe XIII 320.80Å, Fe XV 327.02Å, Fe XIV 334.17Å, Fe XVI 335.40Å.

Pointing: This scheme should be run on a quiet Sun region anywhere on the solar disc.

Frequency: This scheme should be run periodically throughout the mission - perhaps once per month.

Operating Details:

- **CDS**

Phase 1: NIS, Raster area 32x240 arcsec, Slit 4x240 arcsec, 8 locations. Exposure time = 30 seconds. Total duration = 433 seconds (incl. overheads). Line selection - He I 584.33Å, Mg X 609.79Å, 624.94Å, Fe XIII 320.80Å, Mg VIII 313.73Å, Mg VIII 317.01Å, Fe XV 321.78, 327.02Å, Fe XIV 334.17Å, Fe XVI 335.40Å, Si IX 345.13Å, Si XII 520.67Å - 13 lines, 21 pixels across each - 54 sec to telemeter. Total cadence = 433 sec.

Phase 2: GIS, Raster area 32x32 arcsec, Slit 4x4 arcsec, 64 locations. Exposure time = 20 seconds. Total duration = 1296 sec. Extract all data (emphasis of study is on lines listed above). Telemetry time = 13 sec. Total cadence = 1296 sec.

Operation: Phase 1, Phase 1, Phase 2, repeat three times - Total duration = 112 minutes (including 20

CDS Study ID: ICCAL

- **SUMER**

Phase 1a: Raster area 30x300 arcsec, Slit 1x300 arcsec, 40 x 0.76 arcsec steps, accumulate 7.5 s per step = 300 sec. Wavelength selection = 1150-1190Å.

Phase 1b: Raster area 30x300 arcsec, Slit 1x300 arcsec, 40 x 0.76 arcsec steps, accumulate 7.5 s per step = 300 sec. Wavelength selection = 1215-1255Å.

Phase 2: Raster area 30x300 arcsec, Slit 1x300 arcsec, 40 x 0.76 arcsec steps, accumulate over 32 seconds per step = 32 x 40 = 1280 sec. Wavelength selection 1524-1564Å.

Operation: Phase 1a, Phase 1b, Phase 2, repeat three times - Total duration = 94 minutes.