GOLF-VIRGO-MDI Intercalibration

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Objectives
Investigate the noise properties of the data products of the respective instruments by detailed intercomparisons. To achieve the scientific objectives of the individual investigations and the SOHO mission as a whole it is essential that the level, the spatial and time variation of both the instrumental and solar noise is understood.

The specific outputs of this study will be:

- Systematic errors of each instrument.
- Sensitivities of the instruments to different sources of solar noise.
- Comparisons of absolute calibrations and offsets.

The results of this study will be provided to all the investigators of the GOLF, MDI and VIRGO investigations to aid them in the scientific interpretation of the data.

This study will be based on a short (≈ 2 weeks) simultaneous time series from the three participating instruments. The length of 2 weeks is required to follow structures rotating over the solar disc. To be able to aid the other investigations this time series should be taken as early as possible in the cruise phase. In addition attempts will be made to coordinate small snapshots of high resolution and other ground based observations.

Work Plan
The study requires the following data obtained simultaineously from the SOHO helioseismic instruments:

VIRGO SPM	(Level-1+)
VIRGO LOI	(Level-1+)
GOLF	(Level-1)
MDI LOI Proxy	(Level-1)
MDI FD Velocity	(Level-0.5/1)
MDI B, I_c, I_l	

In addition shorter units of the following ground based data is wanted:
Mt. Wilson Doppler/Magnetograms
GONG Velocity, I_c, I_l
La Palma I, V and B high resolution data for 1-3 hours at 3 heliocentric positions (μ=1.0, 0.5, 0.2).

Furthermore the output from the SOHO coronal instruments should be monitored for extradordinary activity (strong flares etc.) that may influence the signals.

The available timeseries at different spatial resolutions will be compared by successively deterioating the spatial resolution. For intensity measurements this could be the sequences:

1. La Palma (short snapshot)
2. MDI I_c,, full resolution (8hours)

3. MDI I_c,, GONG resolution (24 hours)
4. GONG I_c,, full resolution (24 hours)
5. MDI I_c,, LOI proxy subset resolution (2 weeks)
6. MDI I_c,, LOI proxy resolution (2 weeks)
7. LOI single pixel resolution (2 weeks)
8. LOI added pixels (2-12) resolution(2 weeks)
9. SPM (2 weeks)

Similar types of sequences apply to the velocity measurements. There has to be close interaction between the interpretation of the velocity and intensity intercomparisons to understand the effects of velocity/intensity cross-talk in the MDI data.

As the final part of the work comparisons of the noise signatures in velocity and intensity should be carried out.

Responsibilities

Each of the main investigators has the responsibility of making the required time series from the respective instruments available to the other investigations.

The interface to the required ground based data has not been identified.