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| SOLAR-B<br>EIS<br>EUV<br>Imaging<br>Spectrometer | ***User Needs*** | **userneed**<br><br>**draft 1** |

Issue 1 (draft)

Document ID EIS-sys-eng-userneed-1

Document File Z:\mwt\Projects\Solar-B\EIS\docs\sys\eng\userneed1d.doc

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Date 07/08/98

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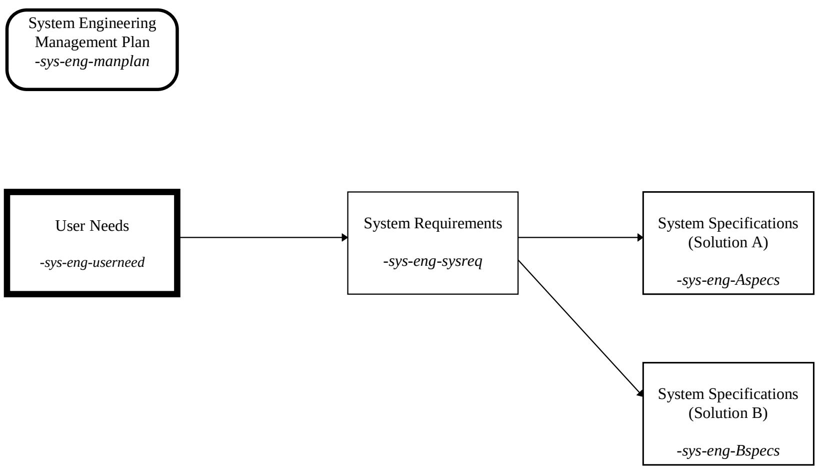
# Introduction

This document is part of the framework for systems engineering for EIS. This is described fully in the Management Plan (ref). In this framework, the development of the system (the EIS instrument) is controlled at the highest level by three documents, namely the *User Needs* document, the *System Requirements* document and the *System Specifications* document.

The User Needs document (this document) expresses the goals which the system's operation will achieve.

The System Requirements document (ref) is a Functional Requirements Document. It reflects a subset of the needs by stating the functional requirements of the system and measurable terms (what the system must do).

The System Specification document describes how the system will meet the requirements. This will refer to the technology to be employed (whereas the Requirements do not).



# User Needs

For the purposes of this document the PI plus the Science Team are regarded as the Users of EIS.

The stated needs are as follows :

- Obtain (spatially resolved) spectra of solar plasmas with:
    - Strong emission lines in 104 - 107 K range of temperatures, corresponding to transition region, solar flares, corona
    - several pairs of lines suitable for density diagnostics
    - good temperature discrimination for flares
    - lines which permit to see the connectivity of coronal plasma to transition regions
    - Low, intermediate and high FIP lines for abundance measurements.
- Obtain context images of those plasmas.
- Detect features with spatial resolution of (range) 1-2” (arc sec). 2 is required, 1 would be good.
- Measure (spatially resolved) plasma velocity (Doppler shift and Turbulent broadening), for events which have typically velocities from 10 km/s to few 100 km/s.
- All instruments on Solar-B should yield correlated observations, which implies knowledge of the alignment and that the fields of view must overlap; and synchronised or well time-tagged observations. There is also a need to correlate Solar-B observations with other instruments on ground based or space based observatories.
- Carry out high cadence (rate of successive) observations. A cadence of the order of 10 s - 20 s (TBD) is needed to follow dynamically evolving features like jets and bright points.