The World Space Observatory Project

WSO/UV: http://wso.vilspa.es/

Background

The World Space Observatory (WSO) concept was developed for the first time in the conclusions and recommendations of the 1st NASA Workshop on Basic Space Science planning for the 1990s. The study was continued under the responsibility of ESA "Observation of the Sun through the Coronal Slab" Working Group (2000).

ESA-CDF assessment study ESA-CDF-035A
http://wso.vilspa.es/docs/WCC/DOC/Attachments/GEN-TN-0001-Draft-0.pdf
This was followed by:

N/A NASA assessment study A0035R: CL-2001-1156
http://wso.vilspa.es/docs/WCC/DOC/Attachments/GEN-TN-0002-1-0.pdf

(May 2000)

WSO/UV facts

WSO/UV is an International Collaboration to build a UV (100-250 nm) dedicated telescope (2.7m) capable of:

- high resolution spectroscopy
- long slit low resolution spectroscopy
- imaging
- free of visibility constraints (L2)
- "real-time" operations

investigate all possible time-scales

WSO/UV principle

Use application innovation, but avoid technical innovation

Use technology as much as possible

Apply new engineering methods (concerted design)

Keep the mission simple;

Science Operations Centers at National level.

WSO/UV features

- High Resolution WSO/UV/H-RIDERS > HST-STIS
  WSO/UV/H-RIDERS > HST-COS
- Sensitivity WSO/UV/H-RIDERS > 5 x HST-STIS
  WSO/UV/H-RIDERS > HST-COS
- WSO/UV is a dedicated facility
- WSO/UV has a High Efficiency of observation at L2

WSO/UV will provide a net increase in UV productivity of a factor ~ 40-50 compared to HST-STIS.

WSO/UV-H-RIDERS vs. HST-STIS

Performance

- High Resolution WSO/UV/H-RIDERS > HST-STIS
- Low Resolution WSO/UV/H-RIDERS > HST-STIS

- High Resolution WSO/UV/H-RIDERS > HST-STIS

Comparison of the effective data rate of the WSO/UV instruments with HST/STIS. WSO/UV H-RIDERS at middle class resolution. The horizontal dashed lines are the data expected for STIS, where the ratio range can be estimated in 1000 for the case of the red spectrum, by the use of the power laws of the intensity with the effective area at 0.3 Å are indicated in the right bar figures.

WSO/UV will allow us to:

- observe objects 4-5 magnitudes fainter than possible with HST, providing completely new opportunities in extragalactic astrophysics and cosmology
- Carry out large scale, high resolution spectroscopic surveys of galactic sources.

With a 2003/2004 launch date, WSO is ideally placed to provide follow-up studies on the large number of UV sources expected from the GAUSS survey.

Science

Main WSO/UV Science Interests of the Italian UV community

- Hot stars and mass loss phenomena, Supernovae (STSN), CT
- Asymmetrical Supernova Remnants
- Interacting Binaries (PD, RM)
- Elliptical Galaxies (NPM)
- Globular Clusters (PI, RM)
- Stellar magnetism from magnetar (NPM)
- Active Galactic Nuclei (PI)
- Cataclysmic Variables (NA, RM)
- X-Shooters Potential (PI)
- Interstellar medium (PI)

Ongoing WSO/UV Observation

- Earth's Heliosphere
- AGNs (PI)
- X-shooters Interstellar medium
- Interstellar medium (PI)

Possible Italian Contribution to Phase A Study proposed to ASI

- Detectors (Photon Counting Intensified Active Pixel Sensor PC-APS)
- Fine Guidance System
- Galileo Avionica, Dip, Astronomia di Firenze (UV, Laben)
- Instruments Control & Data Processing Units (ICU/DPU)
- Laben
- Scientific Objectives Definition

Researchers at several institutions

1. Selection of filters for UV and optical cameras
2. Definition of strategies for precision flight calibration