THE LASCO-ARTEMIS CATALOG LINKS TO THE VIRTUAL OBSERVATORY USING SITOOLS

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Abstract. The LASCO-C2 coronagraph aboard the SOHO solar observatory has been providing a continuous flow of coronal images for the past ten years. Synoptic maps have been built from these images and offer a view of the temporal evolution of the solar corona and Coronal Mass Ejections (CMEs). We present the LASCO-ARTEMIS (Automatic Recognition of Transient Events and Marseille Inventory from Synoptic maps) database. Data have been released using a new automated method of detection of CMEs based on an adaptive filtering and segmentation. Time of appearance, position angle, angular extent and average velocity are released via the SiTools environment and their Virtual Observatory (VO) SVA (Services á Valeur Ajoutée).

1 Introduction

In this paper is first presented a short description of The LASCO-ARTEMIS Catalog and then its implementation in the SiTools software.

2 The LASCO-ARTEMIS Catalog of CMEs

The LASCO-ARTEMIS Catalog (Boursier, 2005 & 2006) indexes CMEs (fig. 1) detected from the Synoptics maps built from the LASCO-C2 images (Brueckner, 1995). CMEs are automatically detected using filtering and segmentation techniques.

The algorithm builds a catalog which lists the CMEs detected given from a Carrington Rotation together with their main estimated parameters: time of appearance, position angle, angular extent and average velocity.

The LASCO-ARTEMIS Catalog is compared with existing catalogs (LASCO CME catalog, CACTUS catalog). We find that i) we detect many more events than the visual detection method but in good agreement with the automated CACTUS detection ii) our rate of events fits very well the pattern of solar activity like the LASCO CME catalog, which has been highlighted by a correlation study with the sunspot number.
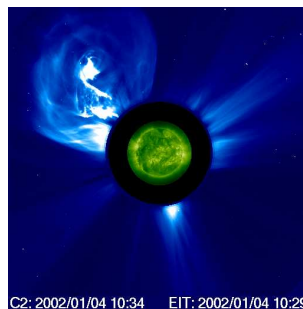

Fig. 1. An example of a CME on a LASCO-C2 image.

3   Use of SiTools and links to the virtual Observatory

SiTools (Système d'Information de Préservation et d'Accés aux Données) is a software developed by Centre National d'Etudes Spatiales (CNES) in partnership with a computing and consulting company. It aims to provide a customizable portal for database, a powerful query builder and a set of J2EE-compliant tools. It allows user to access database with a friendly web interface (left fig. 2).

Fig. 2. Web interface of the LASCO-ARTEMIS Catalog using SiTools and a VO Table formated data output provided by a SVA module.

This modular system, which features a virtual Web Service bus, will ease the development of middleware layers enabling interconnection of VO value-added services (SVA) with existing astronomical datasets. The SVAs modules will allow connection throughout the VO and data extraction for Web Services analysis. SVA can be developed for any purpose using java computer language. A VO Table formated data output has been implemented through a SVA (right fig. 2).

4   Conclusion

The LASCO ARTEMIS CME database has been chosen to be part of the experimentation of using SiTools as a VO compliant portal to the databases of the LAM. The LASCO-ARTEMIS Catalog powered by Sitools will be soon available as public data on the LAM website. Modifications are underway to make the LASCO-ARTEMIS able to give added value data with direct access to CME Characteristics, such as statistics plots.

References

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