

CHAMP-ISDC – Informationssystem und Datenzentrum für geowissenschaftliche Produkte des CHAMP-Satellitenprojekts

CHAMP-ISDC – Information System and Data Center for Geoscientific Products of the CHAMP Satellite Project

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key words: Metadata, Metadaten, DIF, GIS, CHAMP, GRACE, GESIS, ISDC, Information System and Datacenter, Datenmanagementsystem, Datawarehouse, Clearinghouse, Gravity Field, Magnetic Field, Atmosphere/Ionosphere, Geomonitoring

Zusammenfassung

Die wissenschaftlichen Aufgaben der CHAMP-Satellitenmission bestehen in der genauen Vermessung des Erdschwerefelds, der Bestimmung zeitlicher Variationen des Erdmagnetfelds und der Messung ausgewählter Parameter der Erdatmosphäre.

Das CHAMP-ISDC (**Challenging Mini-Satellite Payload – Information System and Data Center**) Projekt wurde initiiert, um eine informationstechnologische Infrastruktur für das Management geowissenschaftlicher Produkte, die aus den Messungen an Bord des CHAMP-Satelliten und dem zugehörigen GPS- und Laserradar-Bodenstationsnetz gewonnen werden, zu entwickeln, aufzubauen und zu betreiben (<http://isdc.gfz-potsdam.de/champ>). Es wird ein operationelles Datenmanagementsystem vorgestellt, das prozessierte Messergebnisse in Form von Dateien entgegennimmt, archiviert und auf Anfrage über ein Web-Portal auf verschiedene Arten registrierten Nutzern bereitstellt.

Summary

The three main scientific objectives of the CHAMP (Challenging Mini-Satellite Payload) satellite mission are high-precision measurements of the Earth's gravity, assessing variations of the magnetic field, and selected parameters of the Earth's atmosphere. In conjunction with the twin satellite mission GRACE (Gravity Recovery And Climate Experiment), 300 MB of data products per day are currently being retrieved from instruments on board the satellites and from associated GPS and laser radar ground station networks. An ever increasing mass of data produced by these and forthcoming missions requires a huge data archive and a scalable information system.

Besides the challenge of large volumes of data, technical issues that must be resolved include: Continuous operation and availability, huge diversity of input parameters (data volume, file sizes and input frequency), multiple modes of product distribution and transfer mechanisms, and the absolute necessity that security restrictions and data access policies be guaranteed. Accordingly, the CHAMP-ISDC (Information System and Data Center) project has been initiated at GFZ in order to design, construct and operate an information infrastructure for the management of geoscience products (<http://isdc.gfz-potsdam.de/champ>). This paper discusses a data management system for the input, the archiving and the accessing of data products and the processed result files.

On the data input side, mission scientists are asked to put products into a set of dedicated directories at an FTP server at GFZ. This is both convenient for the scientists and also makes possible a centralized data store. These input directories are periodically scanned, and data files are archived. Product metadata are put into a database. After product registration the new files will be moved to a long-term tape archive and to a faster disk-based storage location, respectively. The storage component of the system is called Product Archive System (PAS). For each step of the input processes, changes to the product's status are also recorded by the databases. This component of the system is called operational system (OPS). After a specified time, the data files will be made available to the wider scientific community. Prospective users, which currently comprise about three hundred scientists from circa 20 countries, must register at ISDC. After approval by a principal investigator, users can access data products as required and

permitted. They can retrieve products automatically as soon as these are released, or they can browse the product databases interactively over the world wide web (even assisted by some specific applications to visualize and plot data). This part of the information system is called the Product Ordering System (POS).