

統合データベース (AMIDER) の紹介

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本研究は以下の支援を受けています。

➤ 文部科学省・国立情報学研究所

「AI等の活用を推進する研究データエコシステム構築事業 ユースケース創出事業」

AMIDERウェブサイトのコンセプト

- 研究データの“バーチャル博物館” or “プロモーションサイト” (観測データ, 標本データ, etc.)
- 研究データ：研究活動の直接のアウトプット⇒ダイナミックな研究活動の可視化
- 多様な科学分野へのOne-stop gateway
- オープンサイエンス・分野間連携への貢献



- ターゲット
- ✓ 専門分野外のユーザー
- ✓ 異分野との連携に興味を持つ研究者
- ✓ 教育関係者、学生

Space science

Geoscience

Bioscience

⋮

カタログ表示

➤ Webマーケティングで汎用的なデザイン

- ✓ Amazon, YouTube,...
- ✓ 研究データのプロモーションに活かせるヒント
- ✓ サムネイル画像・スニペット
- ✓ 多様なデータセットを一目で把握できる

➤ 研究データの“ブラウジング”自体を楽しめるように

The screenshot shows the AMIDER website interface. At the top, there is a navigation bar with the AMIDER logo and tagline "みんなでつながるサイエンス", along with icons for Japanese language, Terms and Conditions, About AMIDER, and PEDSC. Below this is a search bar with the text "Enter search keyword" and buttons for "AND", "OR", "Search", and "Clear". Underneath the search bar are several category tags: Bioscience, Climatology/Meteorology/Atmosphere, Geoscience, Oceans, Space/Upper Atmosphere, Meteorite, Animal Specimen, Aurora, and Magnetic Field. The main content area features a large banner image of a penguin standing on an ice floe under the aurora borealis. Below the banner, the word "Data" is displayed in red, followed by two sorting options: "Sort by number of accesses" and "Random sort". A grid of ten data items is shown, each with a thumbnail image and a brief description:

- Magnetic field data with 1sec resolution obtained by the fluxgate magnetometer at Syowa Station, Antarctica**
- Digital data of auroral images taken by the all-sky imager (made by Watec) with a filter of 427.8nm wavelength at Kiruna, Sweden**
- Magnetic field data with 1sec resolution obtained by the fluxgate magnetometer at H57, Antarctica**
- Specimen of Adelle penguin (adult) collected in Syowa Station area, East Antarctica (A00025-0001)**
- Digital data of auroral images taken by the all-sky imager (made by Watec) with a filter of 427.8nm wavelength at Tjautjas, Sweden**
- Meteorite found around the Yamato Mountains, Antarctica in the 1974-1975 season (Yamato-74115)**
- Ionospheric data measured with SENSU SuperDARN Syowa South HF radar at Syowa Station**
- Magnetic field data with 0.5sec resolution obtained by the induction magnetometer at Tjornes, Iceland**
- Cosmic noise absorption measured with the 30MHz imaging riometer at Syowa Station, Antarctica**
- Ionospheric data obtained by the EISCAT Svalbard radar (42m parabolic antenna) at Longyearbyen, Norway**

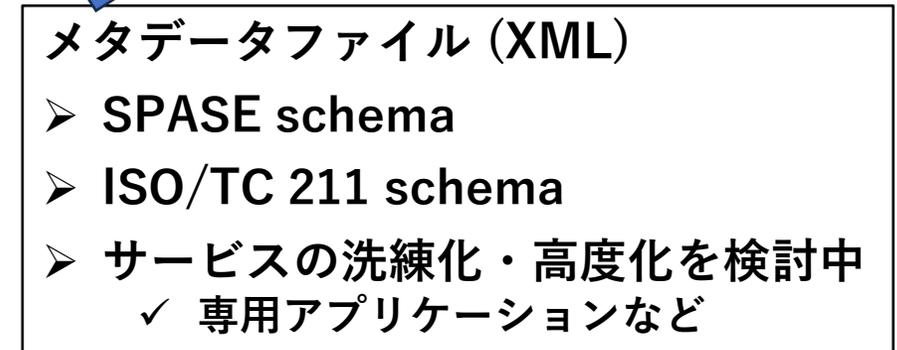
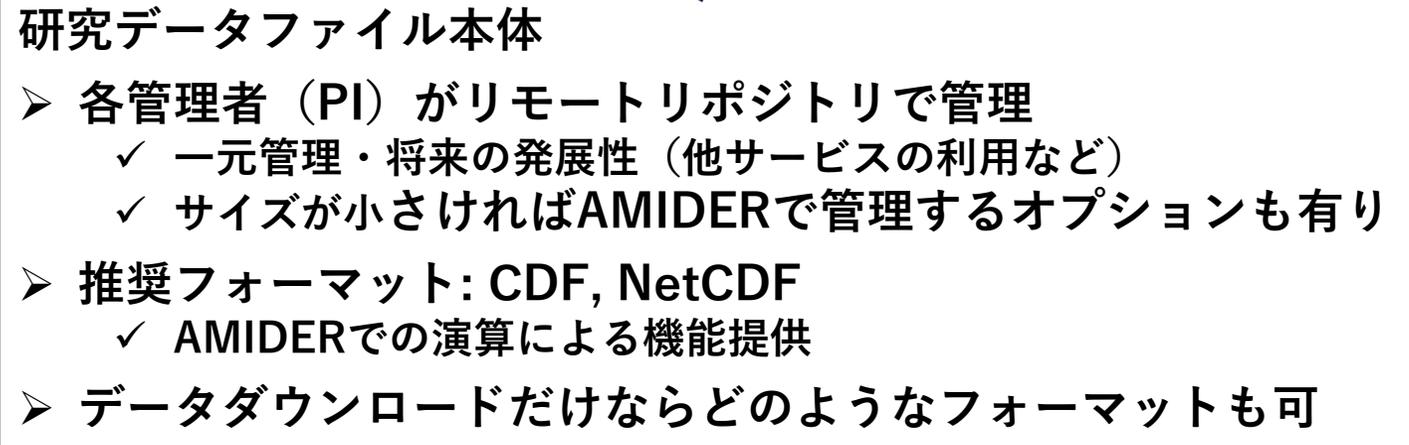
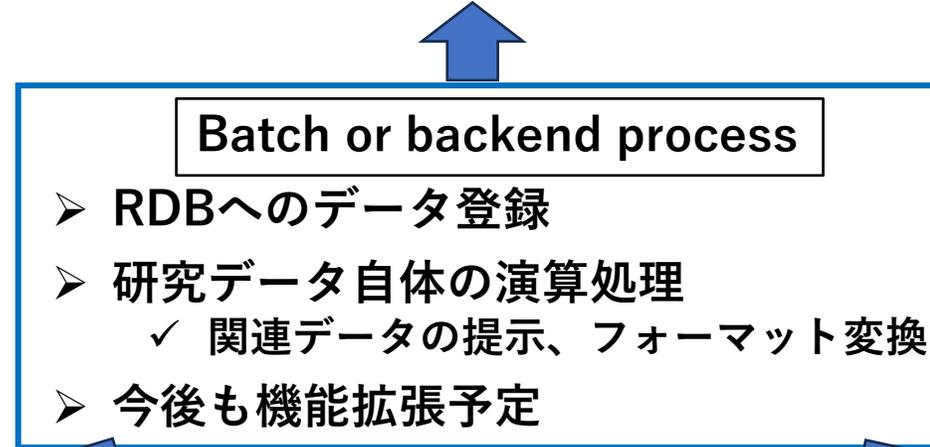
進捗状況

- 3月末頃の公開開始へ向けて準備中
 - ✓ 公開前に完了する作業/公開後のアップデートへ後回しする項目を仕分け
 - ✓ 第1次システムのフィックスへ向けたシステム改修
 - ✓ 各データセットの表示項目のチェック
 - ✓ サービス（データ受け入れなど）の運用方針の策定
 - ✓ AMIDERプロジェクト内・PEDSC内などでのレビュー

AMIDERウェブサイトのデモンストレーション

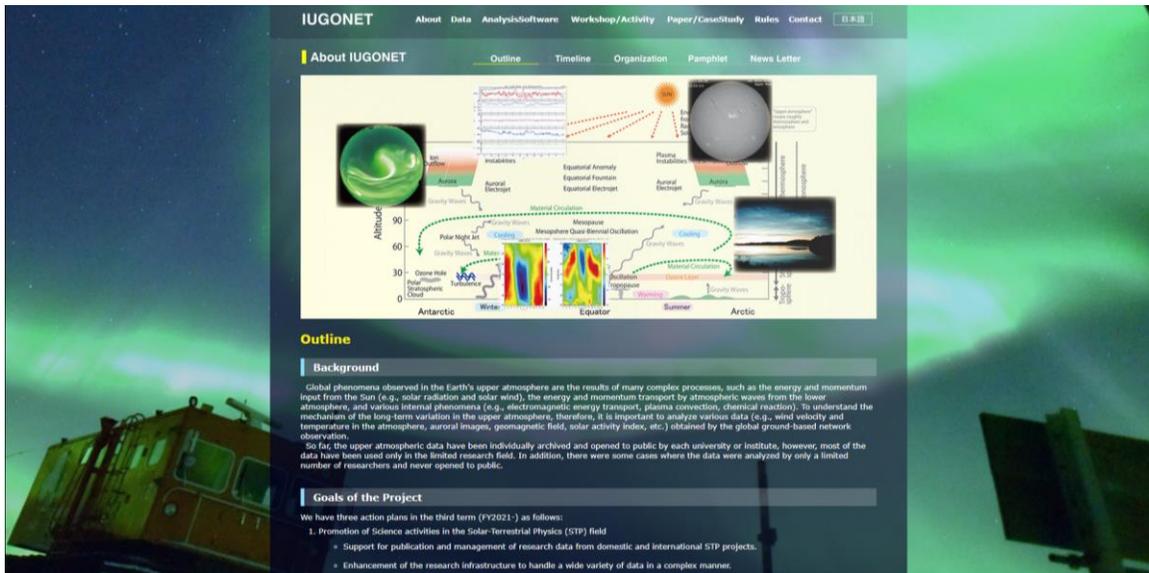
- カタログ表示
- 検索（プリセットキーワード、管理者名など）
- 各データセットページ
 - ✓ 時系列データ
 - データ有無カレンダー
 - データダウンロード
 - フォーマット変換
 - 可視化画像
 - ✓ 標本データ
 - ✓ その他数値データ
- IUGONET・生物標本・隕石標本・ADS
- 英語ページ

System overview



Metadata format

- SPASE (Space Physics Archive Search and Extract)
 - ✓ Managed by SPASE consortium including NASA and JAXA
 - ✓ Standard format in space physics
 - ✓ AMIDER's space science data
- Geographic information/Geomatics schema in ISO standard
 - ✓ Managed by ISO Technical Committee 211
 - ✓ One of the standard formats used by NIPR (National Institute of Polar Research) in Japan



The screenshot shows the IUGONET website. At the top, there is a navigation menu with links: About, Data, Analysis/Software, Workshop/Activity, Paper/CaseStudy, Rules, Contact. Below the menu, there is a sub-menu: About IUGONET, Outline, Timeline, Organization, Pamphlet, News Letter. The main content area features a large diagram of the Earth's atmosphere with various layers and phenomena labeled, such as Polar Night, Aurora, and Auroral Electrojet. Below the diagram, there is a section titled 'Outline' with a sub-section 'Background' and a 'Goals of the Project' section.

Outline

Background

Global phenomena observed in the Earth's upper atmosphere are the results of many complex processes, such as the energy and momentum input from the Sun (e.g., solar radiation and solar wind), the energy and momentum transport by atmospheric waves from the lower atmosphere, and various internal phenomena (e.g., electromagnetic energy transport, plasma convection, chemical reaction). To understand the mechanism of the long-term variation in the upper atmosphere, therefore, it is important to analyze various data (e.g., wind velocity and temperature in the atmosphere, auroral images, geomagnetic field, solar activity index, etc.) obtained by the global ground-based network observation.

So far, the upper atmospheric data have been individually archived and opened to public by each university or institute, however, most of the data have been used only in the limited research field. In addition, there were some cases where the data were analyzed by only a limited number of researchers and never opened to public.

Goals of the Project

We have three action plans in the third term (FY2021-) as follows:

1. Promotion of Science activities in the Solar-Terrestrial Physics (STP) field
 - Support for publication and management of research data from domestic and international STP projects.
 - Enhancement of the research infrastructure to handle a wide variety of data in a complex manner.



The screenshot shows the ADS website. At the top, there is a navigation menu with links: Home, Search, About, Help, Contact. Below the menu, there is a search bar with the text 'English' and a search icon. The main content area features a large banner with the text 'Discover and access Arctic and Antarctic Data'. Below the banner, there are four main sections: Map Search, VISION, VISHOP, and Metadata Catalog. Each section has a corresponding icon and a brief description.

ADS

Discover and access Arctic and Antarctic Data

Map Search

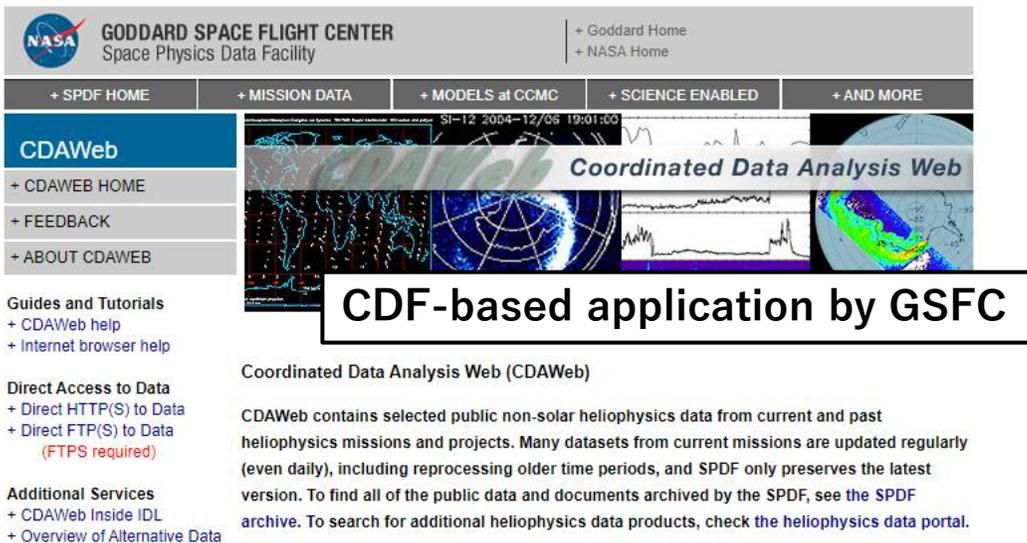
VISION

VISHOP

Metadata Catalog

CDF and NetCDF research data formats

- Self-describing and machine-independent binary formats
 - ✓ Interoperability between platforms is ensured
- CDF (Common Data Format)
 - ✓ Managed by GSFC/NASA
 - ✓ Standard format in space science
 - ✓ AMIDER's space science contents (aurora-image, geomagnetic, or upper-atmosphere data)
- NetCDF (Network Common Data Form)
 - ✓ Managed by NSF Unidata community
 - ✓ Standard format in meteorological science, etc.
 - ✓ AMIDER's meteorological and meteorite-sample data



CDF-based application by GSFC

Coordinated Data Analysis Web (CDAWeb)

CDAWeb contains selected public non-solar heliophysics data from current and past heliophysics missions and projects. Many datasets from current missions are updated regularly (even daily), including reprocessing older time periods, and SPDF only preserves the latest version. To find all of the public data and documents archived by the SPDF, see the SPDF archive. To search for additional heliophysics data products, check the heliophysics data portal.



NetCDF-based data center in NOAA

Looking for Data?

Recent Weather

Search for recent weather data in your area. Weather forecasts are available through the National Weather Service.

今後の展望

- 公開運用の実績を積みつつシステム・サービス開発
- データキュレーションのDX (digital transformation) によるデータ提供者のサポート
 - ✓ オープンサイエンスの促進
 - ✓ データベースの品質向上
 - ✓ e.g., メタデータの自動作成
- 研究データのプロモーションに関する研究開発
 - ✓ 研究データ、研究活動、研究分野の可視化
- 自然言語処理, Text mining, 画像処理, etc.

Attempt of text mining for the research data promotion

- Co-occurrence network of terms in data titles for space science data
- Visualize the overview of scientific fields from the viewpoint of research data

