

## **GLOBAL NEEDS TO BE ADDRESSED IN A STRATEGIC PLAN FOR SPACE WEATHER**

### **Developing products and services in space weather: Space Weather Channel in China**

*(Submitted by XiaoXin Zhang )*

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#### **Summary and Purpose of Document**

This document addresses some issues on Space Weather Channel in China newly developed by National Center for Space Weather and Public Meteorological Service Center of CMA. This channel makes full use of their information and expert resources to create quickly reporting and interpreting mechanisms for domestic and international major space weather events.

Moreover, authoritative voices will be heard for the first time through this channel. It will also release scientific knowledge about space and space weather to the public in the form of articles, pictures and videos by using current Internet resources and technical opportunities. In addition, this channel also cooperates and interacts with colleges, universities and amateur astronomer.

The Space Weather Channel in China is also targeted to integrate superior resources and products of space weather monitoring, forecasting and early warning, as well as relative news and knowledge to amateur astronomers, industrial users and professionals, and people interested in space weather.

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#### **ACTION PROPOSED**

The Inter-Programme Coordination Team is invited to note the issues related to the space weather channel in China when discussing the global needs for further developing space weather products and services.

## DISCUSSION

### 1. INTRODUCTION

In certain conditions, space weather will have great impact on aviation, electricity, communication, navigation, astronomical observation and so on. In these years, the public has been gradually getting more interested in space weather from complete strangers, along with the popularization of astronomy, communication systems and GPS navigation systems. The actual demands are also increasing. In the meantime, space weather has been an important part of China Meteorological Administration's (CMA's) business system. In 2003, CMA established the National Center for Space Weather and began services of space weather monitoring, analytical investigation, forecast and early warning. The center has unique products and advantages in the space weather field.

The China Weather operated by Public Meteorological Service Center is the portal website of CMA to service the public. It has the responsibilities of provide authoritative meteorological products and scientific knowledge to the public. In order to provide professional and authoritative space weather products and knowledge better, the two centers agreed on building Space Weather Channel of China Weather in early 2013, and planned to build a authoritative space weather service platform through complementary resources and combining.

#### 1.1 Background

In early 2013, Public Meteorological Service Center and National Center for Space Weather planned to build an authoritative space weather service platform through complementary resources and combining. The project of building Space Weather Channel of China Weather was official proved. The project was operated jointly by the two centers and cooperated on the basis of their business advantages. While National Center for Space Weather is responsible for providing currently used products of space weather monitoring, forecasting, early warning and assisting to build automatic products transmission mechanism in order to guarantee the accuracy, timeliness and effectiveness of the service information, Public Meteorological Service Center is responsible for channel planning, page design, data processing, system construction and technological development by fully using the experience of building and maintaining China Weather and adapting advanced technology of Internet.

The Space Weather Channel of China Weather ( hereinafter referred to as The Space Weather Channel ) effectively integrated the superior resources of Public Meteorological Service Center and National Center for Space Weather, and provides authoritative products of space weather monitoring, forecasting and early warning for amateur astronomers, industrial users and professionals, and people interested in space weather. The principles and background basis of developing the channel includes:

- **Business Process Establishment**

Provide important reference for the business process design and establishment of Space Weather Channel on the basis of current integrating information collecting, storing, processing and releasing process of China Weather.

- **Database System Establishment**

Design and build the system referring to current database system of China Weather and use the basic data of weather forecasts and current condition from China Weather database.

- **Technical Route Development**

Following the technical route of China Weather, all systems followed the XHTML1.1 encoding specification of W3C, adapting PHP and JavaScript as main program languages, and using techniques such as AJAX comprehensively.

- **The technical development and management group**

Share the same group who built and maintains China Weather. The group has a lot of experiences in building and maintaining websites.

## **1.2 New developments**

The Space Weather Channel was built on the basis of current business and service systems of Public Meteorological Service Center and National Center for Space Weather, integrating Internet resources and enhancing the cooperation with relative colleges, universities and amateur astronomer. The channel will release authoritative and timely information of space weather monitoring, forecasting and early warning, and provide rich and various scientific knowledge and news of space weather.

### ✧ **The Users**

Before building the channel, the planning group of the channel conducted a lot of Internet investigation and visited relative departments such as National Center for Space Weather and Meteorological Administration of General Staff. They analysed the focus groups of space weather and positioned the users in the following fields:

(1) **Amateur astronomers and Internet users interested in space weather**

Including college and secondary school students interested in space weather and astronomy, white-collar class, radio amateurs and short wave (BBC etc.) listeners.

(2) **Industrial users and professionals**

Industries and departments that could be effected by space weather, including pigeon associations and amateurs, employees and researchers from aviation sector, electricity sector, communication sector and GPS related departments.

## **2. ISSUES, CHALLENGES OR OPPORTUNITIES**

### **2.1 Websites in China are few**

Investigations found out that there are few space weather websites in China and abroad which are professional, targeted and comprehensive. There are even fewer websites providing space weather products to the public.

### **2.2 Web products are too professional**

Current web products are too professional for ordinary people to understand. Some of the websites related to aviation and weather contain channel or news of space weather.

### **2.3 Opportunities**

China Weather is the portal website of CMA to service the public. The Space weather Channel in China is also built to service the public. In that consideration, the channel needs to be professional and popular. The design of products considered both public attention and professional support. While the contents highlight public interests on

astronomy and space weather knowledge, the style of the pages is fashionable and presents the high-tech temperament of space weather.

### 3. PROPOSED SOLUTION

After lengthy discussion, Public Meteorological Service Center of CMA and National Center for Space Weather made integrated design and plans for the Space Weather Channel. The channel contains both products and articles, and has 11 regular columns. The columns of the channel are as follows:

Column Name	Contents
Space Weather Early Warning	Space Weather related early warnings released by National Center for Space Weather.
Space Weather Indexes	Including short wave listening index, pigeon flying index and GPS navigation index.
Space Weather forecasts and summaries	Provide space weather trend forecasts of next 3 days and reviews of space weather condition in the past 24 hours.
Sun monitoring pictures	Provide day monitoring pictures of the Sun and update daily.
News	Mainly report on newly happened events and activities in the space weather field.
Space Focus	Cooperating with National Center for Space Weather, follow the news timely as soon as there are space weather events, and present them with illustrations. The pictures are presented in the form of HD photos in order to enhance the visual effect of the channel.
Space Secret	Popular common knowledge of space weather, especially relative to human lives.
Space Weather Events	Integrate historical information about space events and update when something new happens.
Videos	Popular knowledge of space in the form of videos in order to increase the interestingness of the channel.
Expert Interviews	Interview experts when space events happen and provide authoritative interpretation to the public.
Expert Database	Including experts of National Center for Space Weather in all fields.
Space Weather Product Download	Provide inquiry and downloading of space weather daily, weekly and monthly for professional users.

### 4. Project Output and Operate highlights

- (1) **Position accurately:** After lots of investigations, the channel position users mainly as amateur astronomers and supplemented by professional users. Positioning differently with other congeneric websites, the channel gave consideration to both profession and popularization in designing products and other contents.
- (2) **Rapid construction:** It only took 4 months to complete the construction of foreground-background, product development, news releasing efficiently and with high quality, and construct a preliminary business process.

- (3) **Cooperatively construction:** The channel constructed cooperatively by Public Meteorological Service Center and National Center for Space Weather. The two centers communicate a lot and share superior resources to build the channel together.
- (4) **Exclusive release:** The featured products of the channel——Space Weather Indexes ( including short wave listening index, pigeon flying index, GPS navigation index of Beijing ) are unique in China. They combine space weather products and public life and thus make space weather application going to the masses from clouds.

## 5. Fufure Actions

- (1) Carry forward the launch of Space Weather Channel.
- (2) Ensure that the products of the channel are safe, steady and efficient.
- (3) Enrich the news contents and scientific knowledge of the channel.
- (4) Monitor product quality by program judging and manual review.
- (5) Make space weather service features jointly.
- (6) Actively promote the channel to the public.