DEVELOPMENT OF CAL SYSTEMS IN JMA

The purpose of this document is to report the present status and plans of Computer Aided Learning (CAL) system developed in JMA.

Development of CAL Systems in JMA

1. Introduction

The Computer Aided Learning (CAL) system has been developed in the Meteorological Satellite Center (MSC) of JMA since FY1994. The CAL system aims at training meteorologists effectively in the field of satellite imagery applications. A CAL module developed in MSC (MSC-CAL) on personal computers, which was partially introduced in nephanalysis training classes of JMA in FY1997, proved its usefulness for both trainers and trainees. In FY1998, MSC-CAL was fully introduced into nephanalysis training classes.

The MSC-CAL based software has been expanding its field of utilization not only as training materials but also as one of tools in real time nephanalysis.

2. Present Status

2.1 MSC-CAL

The general idea of CAL is a computer system which shows or tells specific material related to the study subject, and subsequently, it asks a learner some questions to check the level of his/her understanding. The type of CAL may be effective to instruct meteorology, but not enough for forecasters who learn nephanalysis technique in order to use for weather forecasting.

In the early stage of development, MSC identified the functional requirements of CAL for training forecasters, and determined its specifications. Its functions include brightness adjustment, level conversion, direct readout, measurements on images, making cross sections and animation. The software was named MSC-CAL. The MSC-CAL software has become not only CAL software but a practical interactive nephanalysis tool as well.

2.2 Training

MSC-CAL is used in nephanalysis training classes, in which trainees learn cloud type discrimination and cloud pattern recognition, and in training classes of typhoon intensity analysis. When MSC-CAL was introduced in a training course for meteorologists from developing countris in 1997, it was found that MSC-CAL greatly contributed to improvement of the participants' understanding and lessening the amount of preparations by trainers. As these positive impacts were observed, MSC changed almost all training materials for nephanalysis from conventional image prints to the MSC-CAL based ones.

As the MSC-CAL module is stored in a CD-ROM, it is easy to bring the module to training classes everywhere. In FY1998, JMA held training courses with MSC-CAL in Thailand, Vietnam and in other places and it gained a good reputation.

2.3 Software development

MSC has been developing and upgrading the MSC-CAL software to improve the nephanalysis training and to reinforce functions to analyze the satellite imagery. New functions include overlaying meteorological data such as surface and upper reports

on satellite images, displaying illustrations and hyperlinking.

3. Other applications

The MSC has developed some application software based on MSC-CAL. Most of them are multi-functional data browsers.

3.1 Data Browser

MSC prepares and distributes CD-ROMs which contain satellite imagery and related data for meteorological research and operational weather monitoring. Those CD-ROMs include an MSC-CAL based data browser so that the users can watch, analyze and animate the satellite imagery and related data. MSC produces the following CD-ROMs.

3.1.1 The Monthly Reports

The "Monthly Report of the Meteorological Satellite Center" had been issued on paper from April 1978 until June 1998. MSC changed the media to the CD-ROM and enhanced its contents in July 1998.

3.1.2 Case Study Reports

MSC issues the "Nephanalysis Case Study Reports" annually as the self-learning material for meteorologists in local weather stations. These reports focus on some significant meteorological phenomena that are notable from a point of view of disaster mitigation, and include explanation or interpretation as well as satellite imagery and weather charts. MSC changed the media of the reports from printed matter to the CD-ROM in 1998.

3.1.3 Database for Specific Subjects

JMA is now preparing the "Annual Report of the RSMC Tokyo-Typhoon Center, 1998", which summarize the activities of RSMC Tokyo in 1998. MSC is preparing a database CD-ROM that includes satellite images of typhoons and related data as an appendix to the report.

MSC has plans to make database CD-ROMs on specific meteorological phenomena or applications.

3.2 LRIT Data Browser for SDUSs

In addition to the satellite imagery, JMA will start disseminating meteorological observation data and NWP products by LRIT with the commencement of MTSAT operation.

MSC has been developing the LRIT browser based on MSC-CAL, which will be provided to national meteorological services which intend to use LRIT (see JPN-WP-11). The software is expected to be an effective tool for utilizing the MTSAT LRIT data/products.