CGMS-XXIX JPN-WP-15
Prepared by Japan
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Discussed in WG III

Impact Experiment on NWP with Rapid Scan CMW

In response to the Actions 28.32 and 28.33, JMA reports to CGMS XXIX on an experiment of the Cloud Motion Wind (CMW) derivation in the 15-minute interval rapid scan observations including an impact assessment for the Numerical Weather Prediction (NWP).

No action is required on this subject.

Impact Experiment on NWP with Rapid Scan CMW

1. Background

At the CGMS XXVIII meeting, the Working Group (WG) III recognized the usefulness of further work with regard to the success of recent experiments (e.g. FASTEX) addressing targeted observations. Recalling suggestions from IWW5 and recent progress on the use of rapid scans for wind derivation, WG III expressed the need to obtain a coherent picture of current activities on rapid scans (operational and pre-operational) at the centers producing satellite-tracked winds. Therefore WG III requested the following actions:

ACTION 28.32 CGMS Members to report on experiments on targeted observations using rapid scans and to explore the impact on NWP.

ACTION 28.33 CGMS Members, performing rapid scans, to provide at CGMS XXXIX an update on rapid scan schedules and applications of rapid scans including an impact assessment. This should include an NWP experiment with and without the improved winds. The analysis should also address the dependence of wind retrieval on the accuracy of the operational image navigation.

In response to the Action 28.33, JMA reports to CGMS XXIX on an experiment of the Cloud Motion Wind (CMW) derivation in the 15-minute interval rapid scan observations including an impact assessment for the Numerical Weather Prediction (NWP).

Any targeted observations such as THORPEX were not conducted taking into account the limited capabilities of GMS-5 VISSR and the impact to the dissemination schedule for S-VISSR and WEFAX.

2. Operational CMW derivation in 15-minute interval observations

The 15-minute interval observations are performed according to the operation schedule for Typhoon Special Observation when some typhoons exist in the responsible area of the RSMC Tokyo Typhoon Center of JMA and three half-disk images covering the Northern Hemisphere are successively observed from 03:30 UTC once a day.

In the Typhoon Special Observation, the low-level visible winds are automatically produced once a day in the region of 20 x 20 degrees centered at the typhoon with the grid size of 0.5 x 0.5 degrees out of the successive three images of 15-minute interval. The NWP data at 00UTC are used for the height assignment and the quality control.

3. Outline of the experiment

Although the operational CMW derivation in 15-minute interval observations is targeted to the area with in 20 x20 degrees around a typhoon, the observations are performed in almost whole Northern Hemisphere.

The high-level winds of IR and WV are derived in the area as well as the visible low-level winds. The target sizes of 32 x 32 pixels and 16 x 16 pixels are tested for CMW processing. The rapid scan winds are experimentally assimilated to the 6-hourly wind data of the two operational models, i.e. the Global Spectral Model and the Typhoon Model of JMA. The assimilated model output is compared with the control runs with no assimilation of the rapid scan winds in order to assess the impact of them. In this study, the position, maximum speed and central pressure of the typhoons are compared, and two values of 0.6 and 0.8 of the EUMETSAT Quality Indicator (QI) are used for the automatic quality control.

4. Future Plan

At present, the comparison is made only for the two typhoon cases at two different initial times and the checking of the accuracy of rapid scan CMW is not fully completed because of the limitation of the time for preparation.

JMA will continue the further study of the Cloud Motion Wind (CMW) derivation in the 15-minute interval rapid scan observations including an impact assessment for the Numerical Weather Prediction (NWP). The results of the further study would be brought at the sixth international winds workshop to be held in May 2002 if good resolution could be given in the study.