



International Civil Aviation Organization

THE SIXTH MEETING OF IONOSPHERIC STUDIES TASK FORCE (ISTF/6)

Bangkok, Thailand, 19 – 21 January 2016

Agenda Item 4: Review of deliveries of Tasks and related Action Items

b) Task 2 - Iono Analysis

CURRENT STATUS OF DATA ANALYSIS BY KAIST AND ENRI

(Presented by Japan)

SUMMARY

This paper presents the current status of data analysis jointly conducted by KAIST and ENRI, Japan.

1. INTRODUCTION

1.1 At the 7th webconference of ISTF, it was agreed that the analysis of ionospheric gradients by using the long-term ionospheric anomaly monitoring tool (LTIAM) should be conducted by sharing efforts by four volunteering parties including Australia, India, and Japan.

1.2 While India (Dr. Sunda, Airport Authority of India (AAI)) and Australia (Dr. Terkildsen, Bureau of Meteorology (BoM)) analyze data from India and Australia, respectively, Korean Advanced Institute of Science and Technology (KAIST) (Dr. Lee), and Japan (Dr. Saito, Electronic Navigation Research Institute (ENRI)) agreed to jointly analyze the other data contributed to the ISTF.

2. DISCUSSION

2.1 As a first step, it was agreed over e-mail discussion that data from Hong Kong and Thailand would be analyzed, because the data sets include dual-frequency observation data from a good number of stations in RINEX format which is suitable for LTIAM analysis. It was further agreed to analyze the data for 20 days of magnetic disturbances. The dates are summarized in Table 1.

2.2 The 20 days were divided into 2 sets of 10 days which would be analyzed by KAIST and ENRI, respectively. This is because the LTIAM tool is designed to work effectively for a number of stations, and it was considered that dividing data by dates for all the available stations would be more effective than dividing stations for all the dates of interest.

Table 1. Date with severe magnetic disturbance for the first analysis

| | Year | Day of year | Kp | Dst |
|-------|------|-------------|-----|------|
| KAIST | 2000 | 97 | 8.3 | -287 |
| | 2000 | 197 | 9 | -289 |
| | 2000 | 225 | 7.7 | -235 |
| | 2001 | 90 | 8.7 | -387 |
| | 2001 | 102 | 7.3 | -236 |
| | 2001 | 328 | 8.3 | -221 |
| | 2003 | 303 | 9 | -383 |
| | 2003 | 324 | 8.7 | -422 |
| | 2004 | 313 | 8.7 | -374 |
| | 2004 | 315 | 8.7 | -263 |
| ENRI | 2000 | 96 | 8.7 | -288 |
| | 2000 | 198 | 7.7 | -301 |
| | 2000 | 261 | 8.3 | -201 |
| | 2001 | 101 | 8.3 | -271 |
| | 2001 | 310 | 8.7 | -292 |
| | 2003 | 302 | 9 | -350 |
| | 2003 | 304 | 8.3 | -307 |
| | 2003 | 325 | 6.7 | -309 |
| | 2004 | 314 | 8.7 | -214 |
| | 2005 | 135 | 8.3 | -247 |

2.3 Depending on the time necessary for the analysis, further analysis will be conducted for days in Equinox seasons where plasma bubble activity is generally high.

2.4 Data sets including the days of interest have already been transferred to KAIST, and the initial results have already obtained, which are reported to this meeting as a separate presentation.

2.5 ENRI has already prepared installation of LTIAM and adjustments of the tool for its local environment have been completed. The initial results are also reported to this meeting as a separate presentation.

2.6 KAIST and ENRI will continue analysis for Equinox seasons as much as the time permits.

2.7 ENRI is willing to share the experiences in starting up LTIAM analysis with localization for the ISTF data.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to do the following:

- a) note the progress of the shared analysis by KAIST and ENRI;
- b) review the results obtained by KAIST and ENRI in separate presentations; and
- c) discuss any relevant topics as appropriate.
