Cloud Automatic Observation System in Korea

Dong-Oh Park, Ki-Ho Chang, Jin-Yim Jeong, Mi-Young Kang, Jeong-Ho Lee, Jeong-Hwan Choi, Baek-Jo Kim

nims, Applied Meteorology Research Division
I. Introduction of Cloud Automatic Observation System

**background of construction**

- Cloud Automatic Observation System was developed to measure the height of the cloud, amount of clouds, cloud form and to gather measured data of clouds.

**Purpose of system installation**

- To review & research of installing Cloud Automatic Observation System at ASOS and AWS sites through standardization of system management & applications and efficiency of maintenance.
II. Intelligent Cloud Automatic Observation System

Research Methods

- Fig 1. (a) display a per-pixel area in order to remove from the solar source (b) solar area of the video image
- Fig 2. Display: (a) in the video image (b) pixels per sky area and the cloud area
- The cloud height calculating step calculates the average height of the cloud height handle only cloud area of the video images acquired for cloudiness calculation(pixel-by-pixel cloud height determines the second cloud region height position corresponding to using a single camera, and the image that the height defined as the area of cloud height)
- Cloud cover, cloud height observation equipment is designed to automatically calculate integrated into the calculation, but each new development in each of the calculation algorithm technology equipment and cloud cover, cloud height represents the image processing algorithms to calculate a variety of video and cloud WMO regular observations

Image processing algorithms

- Extraction of the cloud area
- Calculate the amount of clouds
- Measuring height (unjeo) in the cloud
- Stereoscopic

Full information cloud Building models DB (numerical data, video data)
III. Results

Moderation
- The development of cloudiness clouds automatic observation system automatically calculates the results and the result average weekly average of 84.4% compared with the observed results mokcheuk, showed nightly average of 82% by an exact match as the result appears Table 1.

Summary and Discussion
- Partly automated observation system is a system that automatically observed by the cloudiness and cloud height by image expression method
- Existing cloud cover, cloud height was observed in the method and algorithm for calculating the clouds automatic observation system automatically calculates the respective integrated cloud cover and cloud height at the same time
- Future studies of this system by the unhyeong analysis based on cloud height and cloud cover data contribute to the Meteorological Observation and clouds clouds field of study

Table 1. Extraction algorithms used cloudiness result (May 2009, compared with New Daegwallyeong Meteorological eye measurement).

<table>
<thead>
<tr>
<th>Success rate</th>
<th>Day</th>
<th>Night</th>
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<tbody>
<tr>
<td>~30%</td>
<td>42/50</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>84%</td>
<td></td>
</tr>
<tr>
<td>30~70%</td>
<td>131/150</td>
<td>Middle</td>
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<tr>
<td></td>
<td>87.3%</td>
<td></td>
</tr>
<tr>
<td>70~%</td>
<td>170/200</td>
<td>High</td>
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<tr>
<td></td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td>81/100</td>
<td>100%</td>
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<tr>
<td></td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>424/500</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>84.8%</td>
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V. Future Plans

- Development of prototypes of new cloud automated observing systems (9 woljung 2016)

- Main Specification
  - Improved image acquisition methods: conventional imaging shooting left and right → the new, left and right stereo Skopje tick shooting
  - High-resolution cameras: Existing analog megapixel → new 18 million pixel digital Camera cap debris removal device
  - Weight: 350 ~ 950kg → existing new 50 kg or less
  - Administration Enhancements: Install automatic temperature control and camera cap debris removal device

- Equipment schematic
  - Fig.3. The new schematic image acquisition unit equipment
Thank you