

Lightning Detection System in Korea Meteorological Administration

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Abstract

Lightning is a meteorological phenomenon by which electricity accumulated in the cloud plunges into the ground. The recent increasing of the outdoor activities and the use of electromagnetic products has multiplied the number of victims of lightning. It sometimes causes the loss of life, forest fires, and severe facility damages.

In Korea, lightning activities are monitored through a nationwide network consisting of seven IMPACT-ESP (IMProved Accuracy from Combined Technology Enhanced Sensitivity and Performance) sensors and 17 LDAR-II (Lightning Detection And Ranging System) sensors which detect cloud to ground discharges and cloud to cloud discharges, respectively. The information on the direction, time and intensity of lightning are transferred to the analysis workstation at the KMA(Korea Meteorological Administration) headquarters. The analyzed data are displayed in images and used as an auxiliary tool to issue weather advisories for flash floods with lightning.

KMA has developed the early warning system for lightning and the test is ongoing since September in 2007. If there are more than 21 lightning strokes in ten minutes in the area of any district in Korea, the warning message will be sent to the people who are in that district at that time by a cell-phone. This warning system would be useful to prevent the casualties by lightning.

Introduction

Lightning is a meteorological phenomenon by which electricity accumulated in the cloud plunges into the ground. A typical lightning stroke carries an electric charge of several million volts. The recent increasing of the outdoor activities and the use of electromagnetic products has multiplied the number of victims of lightning. It sometimes causes the loss of life, forest fires, and severe facility damages.

Lightning detection system in Korea

In Korea, lightning activities are monitored through a nationwide network consisting of seven IMPACT-ESP (IMProved Accuracy from Combined Technology Enhanced Sensitivity and Performance) sensors and 17 LDAR-II (Lightning Detection And Ranging System) sensors which detect cloud to ground discharges and cloud to cloud discharges, respectively. Figure 1 shows the lightning sensor's location in the Korean Peninsula. The information on the direction, time and

intensity of lightning are transferred to the analysis workstation at the KMA(Korea Meteorological Administration) headquarters. The analyzed data are displayed in images and used as an auxiliary tool to issue weather advisories for flash floods with lightning. KMA produces and utilizes the mosaic images of satellite-lightning and radar-lightning as well as real-time cloud to ground discharges(Fig. 2). All of this information are provided to the general public on the web-site (www.kma.go.kr).

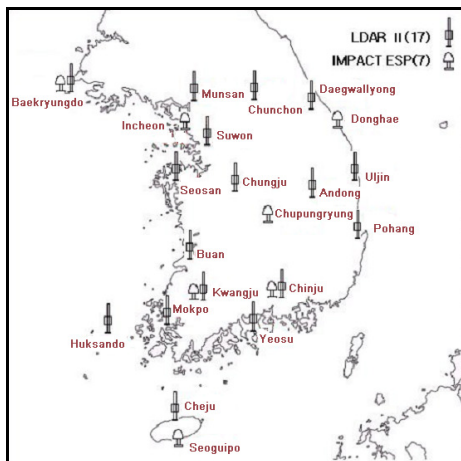


Fig. 1. Location of the lightning sensors

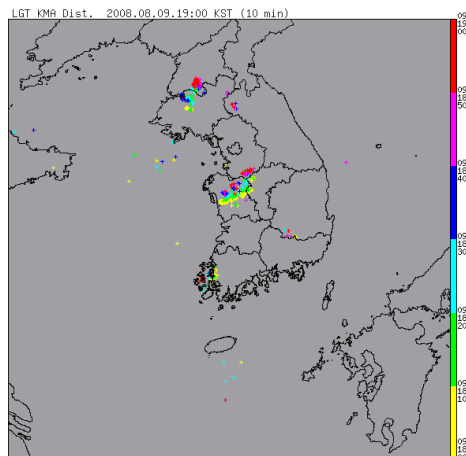


Fig. 2. Mosaic image on the web(9 August, 2008).

Real-time warning system

KMA has developed the early warning system for lightning and the test is ongoing since September in 2007. If there are more than 21 lightning strokes in ten minutes in the area of any district in Korea, the warning message will be sent to the people who are in that district at that time by a cell-phone. Therefore the people in the dangerous area could recognize that lightning systems are coming soon and take shelter from the lightning. This warning system would be useful to prevent the casualties by lightning.

Conclusion

KMA makes every effort to provide timely, accurate, and valuable services by forecasting the weather influencing our daily life and the possibility of natural disaster. Monitoring the lightning phenomenon and warning the risk of that are important tasks to achieve the services. Therefore, KMA will continuously make an effort to improve this lightning detection system.