Simulation analysis of volcanic clouds at Mayon volcano

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http://www-sci.edu.kagoshima-u.ac.jp/st-sci/physics/

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Mayon volcano is located about 300km ESE of Manila, and currently the most active in the Philippines. In the 1993 eruptions, 77 people perished in the pyroclastic flows. In 2000 and 2001, big eruptions with lava and pyroclastic flows occurred: over 25000 people were temporarily evacuated. Eruptions may endanger the air traffic.

At Mayon Volcanic Observatory, located at 11km SSE from the sumit crater, a digital still camera and a video camera have been set to record the volcanic clouds with one hour interval, and 0.5sec with ten minute interval, respectively. The still camera data and the video data which are used for analysis were recorded from 22 June to 18 August and from 22 June to 21 September, respectively in 2003. When volcanic cloud was not observed in the night, or when metrological clouds obscured the view, the data are removed from the analysis. The interval data of digital still camera and video camera are shown in http://arist.edu.kagoshima-u.ac.jp/volc/mayon/. From the end of February 2004, the record will be done by using network cameras with visible and near infrared images.

The analysis of the data is done by setting various parameters of volcanic clouds in a Visual Basic simulation program, to compare with the image data for investigating plume height and form of volcanic cloud.

In Sakurajima, Kagoshima, Japan, the volcanic plumes forming lee wave that descend to ground level are often observed. However, Mayon volcano is 2462m above sea level, quite higher than Sakurajima, and the Froude number is not so large to flow the plume down to the foot of the volcano.