

Estimation of the Building Damage Cost Effect to Strong Wind by Typhoon

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In reducing the damages caused by typhoons, accurate predictions on the paths and strength of typhoons are important. For this, we applied wind field module of the Florida Public Hurricane Loss Model(FPHLM) to calculate the maximum surface wind speed and classified housing by roof type, the quality of interior and exterior material of a building in Korea.

This study tried to analyze the characteristics of the damages to various factors, and estimate the 3-second gusts on the ground by employing the FPHLM(2005) method on the ground wind speeds calculated on the typhoons in order to estimate the amount of damages to buildings by strong winds accompanying typhoons.

In case of wind speed, we estimated wind speed at 300m level using 700hPa wind according to the research method by Franklin(2003), FPHLM(Florida Public Hurricane Loss Model, 2003), and Vickery and Skerlj(2005). Then we calculated wind speed at 10m level using the estimated wind speed at 300m level, and finally, peak 3second gust on surface.

The estimation results on 3-second gust at 10m level from the typhoon 'Maemi', which did considerable damage to Korean peninsula Gyeongsangnam-do in 2003, using the wind data at 700 hPa show that the 3-second gust increases 0.7 to 0.8 times than 700hPa level wind speed. The results are similar to the observation results of Franklin(2003).

Estimation of the building damage, we need respective components of buildings. The number of flat roof and hip roof type housing is high in Korea, The ratio of width and length of a single housing is about 1.5 and the height of a floor and ceiling are 2.6 to 3.0 m and 2.3 to 2.6 m, respectively.

We estimated the maximum damage amount by the typhoon Maemi based on the nations representative house type about Gyeongsangnam-do and Busan. And we assume the house price is 5 million, to be 6 thousand million won. This amount is an estimation of the maximum damage amount that occurred during the arrival of the typhoon and is based on a specific house type.

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