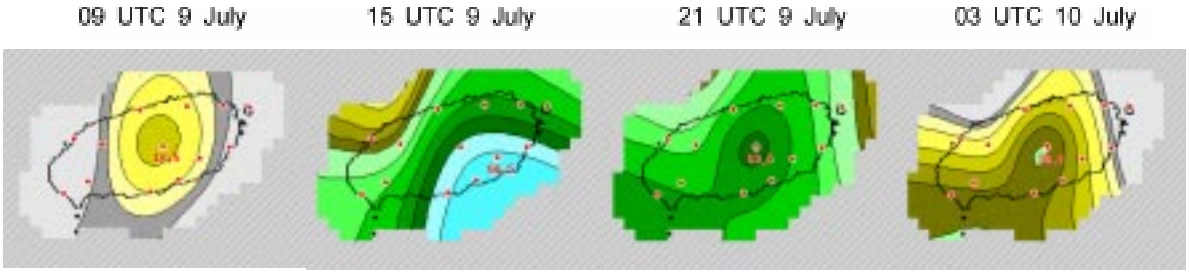

Fig. 4. The evolution of 3 hourly accumulated rainfall amount observed Automatic Weather System from 09 UTC 9 July to 03 UTC 10 July 1999. The contour interval increases logarithmically.

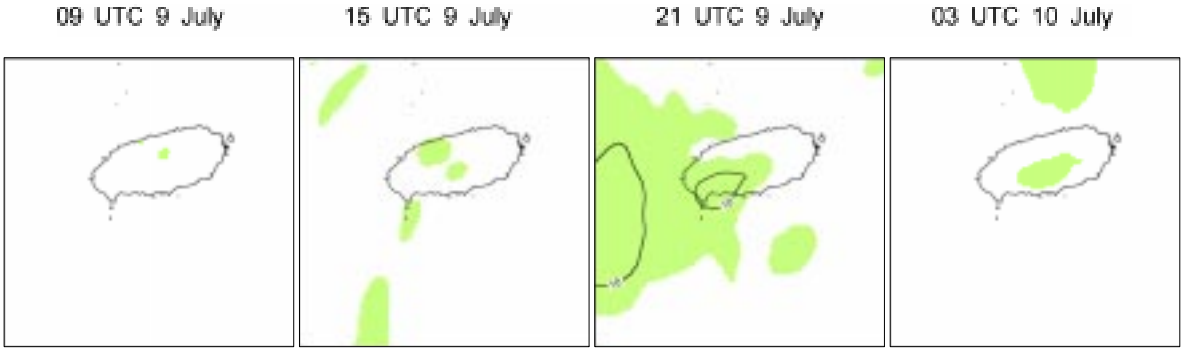

Fig. 5. The evolution of 3 hourly accumulated rainfall amount simulated by MM5-3km without LAPS procedure from 09 UTC 9 July to 03 UTC 10 July 1999. The contour interval is 10mm and the shading area is precipitation area.

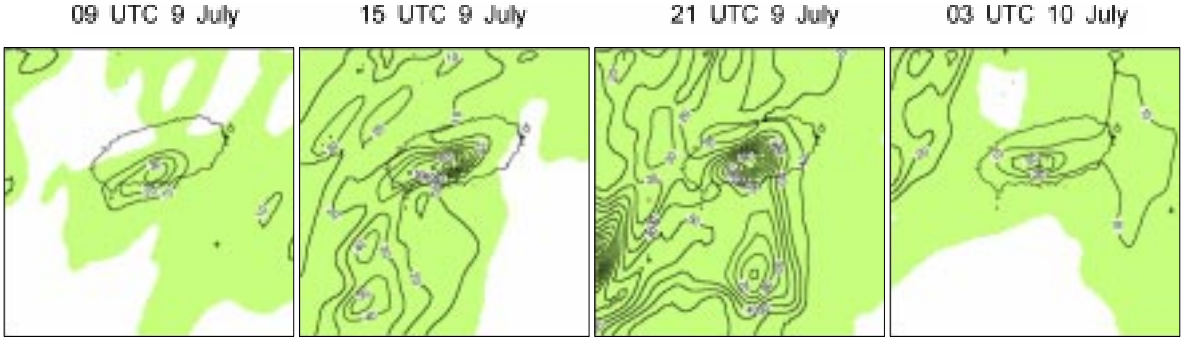

Fig. 6. Same as Fig. 5, except for including LAPS.

inland.

Fig. 5 shows the evolution of 3 hourly accumul -ated rainfall amount simulated by MM5-3km without LAPS procedure. The rainfall amounts were too little and the start time of precipitation was too late comparing observation data by AWS (Fig. 4). Considering that the synoptic data from upper air station was ingested in the first guess data, the MM5-3km without LAPS should have larger domain or use FDDA to improve the prediction skill. But these options are not recommended to be applied to the regional meteorological office because these options required more computational time.

Fig. 6 shows the evolution of 3 hourly accumu -lated rainfall amount simulated by MM5-3km including LAPS procedure. The structure of rainfall amount was very close to corresponding observation. This result shows that high resolution data assimilation is very useful for small domain prediction model.

Fig. 7 and Fig. 8 are RMSE and BIAS of temperature prediction on the lowest layer according to projection and valid time of prediction respectively during May 2000. The observation from 15 AWS