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The effect of orography and sea surface temperature on the heavy snowfall for the eastern region of Korea : A case study with high resolution WRF simulation

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An analysis of the heavy snowfall that occurred on 11-14 February 2011 in the Yeongdong region along the eastern coast of Korea is presented. Relevant characteristics based on observation and model simulations are discussed with a focus on the times of maximum snowfall in Gangneung (GN) and Daegwallyong (DG). This event was considered part of the typical snowfall pattern that frequently occurs in the Yeongdong region due to the prevailing northeasterly flow. The control simulation using the high resolution Weather Research and Forecasting (WRF) model (1km X 1km) showed reasonable performance in capturing the spatial distribution and temporal evolution of precipitation. The area of precipitation maxima appeared to propagate from the plain coastal region further into the inland mountainous region, in relation to the location of convergence zone. In addition, two sensitivity experiments, EXP1 with a smoothed topography and EXP2 with a warmer sea surface temperature (SST), were performed to investigate the effect of topography and SST on the formation of heavy snowfall. EXP1 tended to modify the precipitation distribution, while EXP2 tended to produce more precipitation over the ocean.

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