

Numerical study of moving strong downslope wind Hira-oroshi in Japan

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Strong migrating downslope wind was elucidated using high-resolution non-hydrostatic numerical model. The strong downslope wind appeared at the west side of Lake Biwa is called as Hira-Oroshi. In the Hira-Oroshi region, mountain range over 1000 m-altitude exists in the west side of the lake. The low altitude area exists over the north of mountain range. Hira-oroshi has quite unique characteristics that the strong (-50m/s) wind region with the narrow (-1 km) width migrates within 10 km width in every case.

In authors knowledge, the dynamics of the migrating downslope wind has not been studied yet, although the researchers researched the mechanism of downslope wind in the foot of mountain range through the observations and numerical forecast model. The characteristics of Hira-Oroshi were successfully represented in the high-resolution non-hydrostatic forecast model in this research. The results strongly suggest the synergy effects of the breaking of mountain wave seen at 1 km height and the micro-scale patch of high potential temperature at the surface causes the formation of narrow downslope wind.

Keywords: downslope wind, numerical model