Kuo, K.-T., and C.-M. Wu, 2019: The precipitation hotspots of afternoon thunderstorms over the Taipei Basin: Idealized numerical simulations. *J. Meteor. Soc. Japan*, **97**, 501-517. https://doi.org/10.2151/jmsj.2019-031

Plain Language Summary: During summertime in Taipei, the afternoon thunderstorms usually occur at the south of Taipei basin, a signal of precipitation hotspot. The idealized simulations show that the local circulation is a key for the hotspots. The two valleys guide background southwesterly flow along with the sea breezes to penetrate the basin. The urban heat island effect enhances the sea breeze convergence at the south of the basin and produces strong convection there. Besides, the background wind direction is essential in determining the location of sea breeze convergence. If the background wind direction changes from westerly to west-northwesterly, there might be no precipitation at all in the basin.

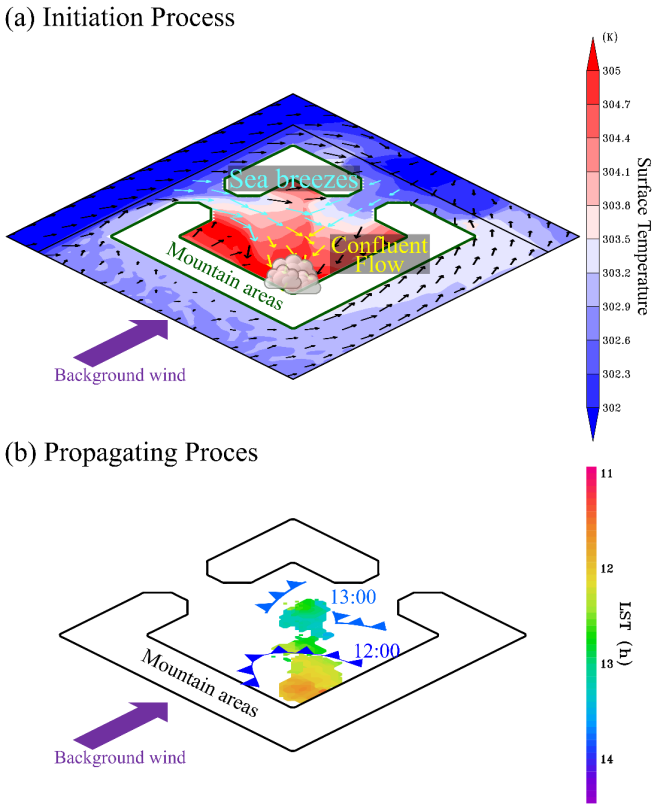

Fig. 1. Three-dimensional schematic diagram of (a) initiation process and (b) propagating process for precipitation hotspots. The base maps are (a) the ensemble averaged near-surface temperature with intervals labelled in the color bar and wind fields at 11:00 and (b) ensemble time evolution of PHs which is the same as Fig. 12. The purple arrows represent the background wind. (a) The blue arrows represent sea breezes, and the yellow arrow represents confluent flows caused by sea breezes from the valleys. The cloud indicates the location triggering convection. (b) The blue and light blue fronts represent cold pool fronts caused by the precipitation hotspots at 12:00 and 13:00. The positions of the fronts are judged by convergence of wind fields under 500 m in the basin area.

- Idealized experiments are designed to understand the essential mechanism for precipitation hotspots (PHs) in Taipei basin.
- The results show that the local circulation is a key for PHs at the south of the Taipei Basin.
- The background wind direction is essential in determining the location of sea breeze convergence, hence the PHs.