



Two types of heat wave in Korea associated with atmospheric circulation pattern

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This study investigates heat wave variability over Korea during 1979-2017. It is found that the heat waves in Korea can be classified into two distinct types based on the spatial patterns of atmospheric circulation anomalies: the zonal wave (Z-wave) type and the meridional wave (M-wave) type. The Z-wave type is accompanied by large-scale atmospheric waves across the Eurasian continent while the M-wave type is associated with convective activities over the subtropical western North Pacific. The Z-wave type occurs when the high pressure node of eastward propagating wave located around Korea and it seems that the associated wave energy could originate from North Atlantic Ocean. The M-wave type, on the other hand, is driven by northward propagating wave train from subtropical western North Pacific to East Asia which is triggered by anomalous convective activity over the subtropical western North Pacific. It is also found that the downward net radiation flux and reduced latent cooling are main factors for driving severe high temperature over Korea for both types of heat wave. By analyzing radiative as well as dynamical and thermodynamical variables, detailed descriptions on the physical characteristics of two types of heat wave are presented in this study along with the possible implications for summer climate variability over Korea