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The remote effect of the Tibetan plateau on downstream flow in early summer

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This study addresses the mechanical and thermal effects of the Tibetan Plateau (TP) on downstream airflow in early summer by using numerical experiments and observational data. The principal finding of the study reveals that the mechanical effect of TP, including air that is warmer than by the giant topography, mainly results in a local response in the atmosphere, i.e., a huge ridge located to the north of TP in the troposphere in June. However, the anomalous TP atmospheric heating associated with global warming can excite a Rossby wave originating from TP via the Lake of Baikal through the Okhotsk Sea downstream. The Rossby wave coincides with the positive phase of the eastern part of a normal stationary wave that often occurs in June; thusthe TP atmospheric heating acts as a secondary wave source in relaying and enhancing the eastern part of the normal propagation.