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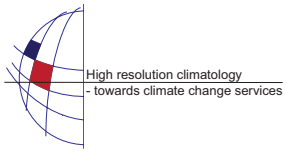

The Remote Effect of the Tibetan Plateau on Downstream Flow in Early Summer

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By using numerical experiments and observational data, this study examined the mechanical and thermal effects of the Tibetan Plateau (TP) on downstream airflow in early summer. Our principal finding is that the mechanical effect of the TP in an atmosphere general climate model (AGCM), including air made warmer by the giant topography than its surroundings climatologically, results mainly in a local response in the atmosphere, i.e. a huge ridge north of the TP in the troposphere in June. There was no Rossby wave response to the mechanical effect. However, simulations and statistic analyses strongly suggested that the anomalous TP atmospheric heating associated with global warming tends to excite a Rossby wave originating from the TP via the Lake of Baikal to continue to move through the Okhotsk Sea to downstream areas. The appearance of the Rossby wave coincides with the positive phase of the eastern part of a normal stationary wave originating in the Caspian Sea traveling via the Okhotsk Sea to the sea area east of Japan that often occurs in June. Thus the TP atmospheric heating acts as an additional wave source in relaying and enhancing the eastern part of the normal wave propagation. Its path is usually lies beyond the latitude line of 40°N, which is where westerly jet stream takes over the role of waveguide.