The Interaction Between Two Separate Propagations of

Rossby Waves

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Abstract

This study deals with two teleconnection patterns and subsequent wave-train propagations during an East Asian summer. Diagnostic results are: (1) A stationary wave ray with zonal wavenumber 5 approximates the arc path (OKJ arc path) linking the correlation centers originating from the Caspian Sea via Lake Baikal to the sea off the southeast coast of Japan (as a focus area) in a pentad correlation map between Z500 and OLR at 30ºN, 150ºE in June 1979-98. Ray tracing shows that it took 8-10 days for this stationary wave to propagate from an initial position around the Caspian Sea to the focus area, which roughly coincides with the observed case in July 1998. (2) A wave-train pattern (P-Ja) observed in boreal summer propagated along the arc line in the same way as the normal poleward Rossby wave train (P-J) originating from the Philippines across the North Pacific, but with a phase shift northeastward of about 90°. (3) Further correlation analyses showed that P-J-like waves belong mainly to intraseasonal propagating ones while OKJ waves belong mainly to intraseasonal stationary ones in general. (4) Propagation of the newly observed wave-train pattern (P-Ja) occurred following another wave-train along the OKJ arc path in mid-July 1998. Both northeastward and southeastward wave propagations merged off the east coast of Japan. (5) The northeastward-propagating wave train observed in mid-July 1998 was triggered by the southeastward-propagating (OKJ) wave train that produced a deep cyclonic circulation and a strong convective activity in the focus area. The link of wave forcing and deep convection was made solely because of a strong upper-level divergence in the focus area.