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Impact of the interannual variation of subarctic circulation on the Boreal-Forest rainbelts

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The Boreal forests along 60° in both the Eurasia and, North American continents are curcial resources to the world timber industry. As shown by our previous study (Yoon and Chen 2006), the boreal-forest rainbelts are maintained by transient disturbances ahead of subarctic troughs over central Asia, , the Bering Sea, and the Labrador Sea. It was observed that the interannual variation of these boreal-forest rainbelts exhibit an eastward propagation. Thus, the understanding of the mechanism causing this propagation and the development of a sound mitigation plan in reponse to this interannual variation of the subarctic hydrological cycle is vitral to the timber industry.
It was observed by our recent analysis that the global divergent circulation in response to the ENSO cycle exhibits an eastward propagation. The interannual variation of the subarctic circulation is reflected not only by the filling/deeping of these troughs, but also the transient disturbance activity. The response of the subarctic circulation to the eastward propagation of the global divergent circulation coupled with the ENSO cycle explains the eastward propagation of the interannual variation of the boreal-forest rainbelt. The rainfall data of GPCP and GHCN, the re-analysis data of ERA-40 and GEOS-5, and the initial analysis of NCEP GFS were employed to identify/depict the interannual variation of the subarctic summer circulation and the maintenance of boreal-forest rainbelts, and the response to the eastward propagation of the global divergent circulation following the ENSO activity.