

In this study, the authors use an alternative balance omega equation to diagnose synoptic scale ascent associated with baroclinic waves propagating across western North America, and use the frequency and amplitude of the ascent as an indicator of storm track activity. They found that based on this metric, the main storm track dips southward from north of 50 N just offshore of British Columbia to near 30 N near the southern border of Arizona and New Mexico and then track northeastward towards the Great Lakes. They also investigated the seasonal and interannual variability of the storm track as indicated by this metric. Overall the results are interesting and since large scale ascent is often related to weather this is a parameter that is worth examining.

Specific comments:

1. In (5), the authors define  $\omega_{\text{bar}}$  by using the maximum omega in a column to obtain the statistics. How different will the results be if, say, only 500 hPa values are used?
2. What is the domain over which (3) is solved? The authors used  $\omega = 0$  at the lateral boundaries. What does the solution look like when a baroclinic wave is entering or leaving the domain?
3. The authors showed one case study showing the difference between the diagnosed omega versus the omega in the reanalysis. The question is, if (5)-(7) are used to compile statistics using the omega provided by the reanalysis data for the climatology, how different will the results be? This is useful information since solving (3) involves getting a lot of data and doing a lot of processing and it is not a simple task to use this parameter as a storm track diagnostic. If results from analyzed omega is not too different then it is difficult to justify going through all these computations. Such a comparison is also useful to see the difference between the diagnosed and analyzed mean omega. This should be something very easy to compute using the analyzed omega.
4. One feature that the authors did not discuss is that on Fig. 4, the storm track as indicated by ascent is as far south as 40N near 150W, but then rapidly extend northeastward to north of 50N by 140W. None of the other storm track indicators shown in Fig. 1 show such a characteristic. Can the authors discuss this a bit?
5. On p. 13, line 277, the authors indicated that Fig. 3 show a

cross section along 41.5N, while the figure caption says 39 N. Which is correct?

6. On p.24-25, b. Discussions, Fig. 11 and 12 should be Fig. 13