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Geoscientific Model Development Discussions

Interactive comment on "Effects of spatial resolution on WRF v3.8.1 simulated meteorology over the central Himalaya" *by* Jaydeep Singh et al.

Anonymous Referee #1

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This article delineates the effects of spatial resolution on the model performance over the central Himalaya. Ground and radiosonde profiles were used to assess the performance of WRF at different spatial resolution. The temporal evolution of meteorological profiles in WRF is seen to be in agreement with the measurements with stronger correlations for upper troposphere than those in the lower troposphere. To use the profiles to assess the model result for mountain region is new in my review. However, I find that this paper does not really reach to main question for mountain meteorology studies. The authors should review the frontier of this area. Only do evaluations is not qualified for GMDD publication. There are some problems with the figures which are not well arranged in a well-know way. An issue is that when they compare model grid values with that of AWS, they might use two temperature at different height. Please compare

the AWS elevation and the grid elevation where AWS located. Use the elevation difference to adjust the model temperature. The same problem also happens to wind speed. There are many evaluation papers for the mountain numerical simulation. The authors should review these papers, try to improve the wind speed performance.

Figure 3, add their difference between d01 and Radiosonde and give some introduction on the difference. Line 261, it's better to add a figure which shows the correlation coefficient r, mean bias etc result for all the height, not only say model captures variations at 500 hPa better than 50 hPa. Its also possible to compare the r and mean bias profiles with the three spatial resolution simulation. Figure 4, many things are not clear in the figure, which year? It also repeat with figure 3. Again, the difference is more interesting to us. Figure 6 the figure legend is not clear at all. Replot the figure with a colored marker. Figure 7 where is (a) and (b) letters? what does "0-6-12-..30" mean in the first wind-rose diagram? then why 0-2, 2-4, 4-6.....legend appears on the right of the fourth diagram? Figure 8, the simulation does not show the diurnal variation in wind speed at all. What's the explanation for it? This is really interesting for mountain numerical simulation.

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