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Interactive comment on "Factors controlling Slope Environmental Lapse Rate (SELR) of temperature in the monsoon and cold-arid glacio-hydrological regimes of the Himalaya" *by* R. J. Thayyen and A. P. Dimri

Anonymous Referee #4

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In their paper, Thayyen and Dimri present an interesting analysis of the changes in surface air temperature with elevation in a high mountain environment. They correctly point out that this has important implications for hydrologic and glaciological modeling. This is an important topic; however, the current paper does not go into enough detail on the observational methods used. In particular, difficulties in measuring precipitation, and local spatial variations in temperature, or microclimates, pose particular problems. The latter is most concerning, as it has direct impacts on the results of the paper. The SELR values >9.8K/km suggest local surface heating, cold air pooling, or other effects

influencing one or more of their measurements. This means that the SELR values they derive are unlikely to be regionally relevant, and thus any analysis based off of these results is problematic. While only one station is particularly effected by this, the authors need to provide a measure of how well all of their measurements represent the surrounding regional air temperature.

In addition, the paper is lacking a bit in its review of the relevant literature and theoretical description of the effects that influence temperatures both at their measurement sites, and on important cryospheric locations such as permanent snow fields and glaciers. Because their measurement sites may not be representative of the sites of hydrologic interest, this topic needs more discussion.

Finally, if the authors can contact a native english speaker to review their paper for grammatical corrections, that would be a great help.

Interactive comment on The Cryosphere Discuss., 8, 5645, 2014.