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Interactive comment on "Thermal resistances in the Everest Area (Nepal Himalaya) derived from satellite imagery using a nonlinear energy balance model" *by* D. R. Rounce and D. C. McKinney

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Dr Colgan,

Your question is rather difficult to answer with currently published data, however, I looked again at the available debris and air temperatures I have from 4800m on the Ngozumpa glacier (27°56'00"N; 86°42'45"E) in case this provides any useful guidance.

Unfortunately we do not have data from the debris/ice interface. The mean temperature from 13th November 2001 - 13th October 2002 recorded at the lowest level sampled in the debris cover (-0.75m) was +1.8°C. This data was recorded using a Gemini data-logger and PG5001 thermistor probe.

Figure 3 in Nicholson and Benn, 2012, based on this data, indicates that mean temperatures in the debris cover over the uppermost 0.75m, are relatively uniform, decreasing only very slightly with depth.

30 minute air temperature at 2m above the debris surface was recorded using a Campbell 50Y, shielded but unventilated sensor from 30th September 2001 - 9th October 2002, and the mean over this time was -0.7°C.

This might at least serve to give you an upper bracket on the possible differences between mean air and ice surface temperatures at this site, but unfortunately it is not adequate data to properly address your question.

Potential sources of more informative data: Dr Jason Gulley may have ice temperatures from within ice caves on the Ngozumpa glacier Dr Ben Brock may have long time series of debris and air temperatures from the Miage glacier, Italy. Dr Francesca Pellicciotti may have long time series of debris and air temperatures from the Lirung glacier, Nepal.

Nicholson, L., & Benn, D. I. (2012). Properties of natural supraglacial debris in relation to modelling sub- debris ice ablation. Earth Surface Processes and Landforms. doi:10.1002/esp.3299

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