Supporting Information for

**Daily air temperature estimation on glacier surfaces in the Tibetan Plateau using MODIS LST data**

Hongbo Zhang1, Fan Zhang1,2,3\*, Guoqing Zhang1,2, Yaoming Ma1,2,3, Kun Yang1,2,3, Ming Ye4

1 Key Laboratory of Tibetan Environmental Changes and Land Surface Processes, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing 100101, China

2 CAS Center for Excellence in Tibetan Plateau Earth Sciences, Beijing 100101, China

3 University of Chinese Academy of Sciences, Beijing, China

4 Department of Scientific Computing, Florida State University, Tallahassee, Florida, USA

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**Introduction**

This supporting information provides additional comparisons between methods using MODIS LST at four pass times, linear regression equations between air temperature and MODIS LST. Some related information about comparison between MODIS LST and observed daily mean air temperature are included. We also provided the estimated air temperature comparison from TLR and Terra nighttime LST in non-glacierized areas.



**Figure S1.** Comparison between MODIS LST and daily mean air temperatures (Tmean). Pearson correlation coefficient (R) is indicated in brackets. \*\*\*: at 0.001 significance level. “TD”: Terra Day; “TN”: Terra Night; “AD”: Aqua Day; “AN”: Aqua Night.

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Figure S2. Comparison between methods using MODIS LST at four pass times for Tmean estimation.

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Figure S3. Comparison between methods using MODIS LST at four pass times for Tmin estimation.

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Figure S4. Comparison between methods using MODIS LST at four pass times for Tmax estimation.P:\modis_lst_glacier_2\compare_gla_and_non-gla_model_s.tif

**Figure S5.** Comparison between the LNGS (adding Z, i.e. elevation factor), LNGS and RGS models for Tmean estimation. “PZ”: Parlung Zangbo; “MA”: Muztagh Ata; “XD”: Xiao Dongkemadi; “ZH”: ZHadang.

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**Figure S6.** Linear regression between Tmin and MODIS LST at four glacier AWSs. The coefficients of determination (R-squared) and equations are shown at top-left in each sub-plot. Equations in red colors indicate the best models and those in blue colors indicate the second best models for different MODIS pass times. “TD”: Terra Day; “TN”: Terra Night; “AD”: Aqua Day; “AN”: Aqua Night.

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**Figure S7.** Linear regression between Tmax and MODIS LST at four glacier AWSs. The coefficients of determination (R-squared) and equations are shown at top-left in each sub-plot. Equations in red colors indicate the best models and those in blue colors indicate the second best models for different MODIS pass times. “TD”: Terra Day; “TN”: Terra Night; “AD”: Aqua Day; “AN”: Aqua Night.

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**Figure S8.** Comparison between the TLR method and the LNGS model based on Terra nighttime LS for Tmean estimation in unglacierized areas. “PZ”: Parlung Zangbo; “MA”: Muztagh Ata; “XD”: Xiao Dongkemadi; “ZH”: ZHadang.