SPATIAL STATISTICAL ANALYSIS ON GLACIER SURFACE ELEVATION CHANGE BASED ON ALS DATA

Introduction

ALS data provides the rastersets which contain the topographic predictor variables (elevation, slope, curvature, sky view and solar potential) for the regression analysis. The dependent variable, surface elevation changes ($\Delta z$), is calculated by subtracting two digital elevation models from two different dates.

Study area

The Hintereisferner (HEF) is a typical alpine valley glacier with an area of ca. 7.49 km² (2008) located in the Ötztaler Alps (Tyrol). Its characteristic long tongue is north-northeast exposed and is in the lower part about 200 m thick.

Surface elevation changes

For a better understanding of the influence of topographic parameter on surface elevation changes, it is important to consider the corresponding delta z itself. The map shows the differences between fall 2007 and fall 2008.

Acknowledgements

The residuals of each predictor from the regression modelling of the year 2007/08 are plotted into one map applying the rule of best fit value. In order to yield honest results, every residual value between -0.5 and 0.5 is not taken in account. The mean residuals in 50m-intervals suggest the redundancy of the predictors curvature, sky view and solar potential.

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