Mind the gap – benchmarking of various imputation approaches for precipitation stable isotope time series

Zoltán Kern[1,2]*, István Gábor Hatvani[1,2,3]*

[1]Institute for Geological and Geochemical Research, HUN-REN Research, Centre for Astronomy and Earth Sciences, Budapest, Budaörsi út 45, H-1112, Hungary
[2]HUN-REN CSFK, MTA Centre of Excellence, Budapest, Konkoly Thege Miklós út 15-17., H-1121, Hungary
[3]Center of Environmental Science, Eötvös Loránd University, Pázmány Péter stny. 1, H-1117 Budapest, Hungary
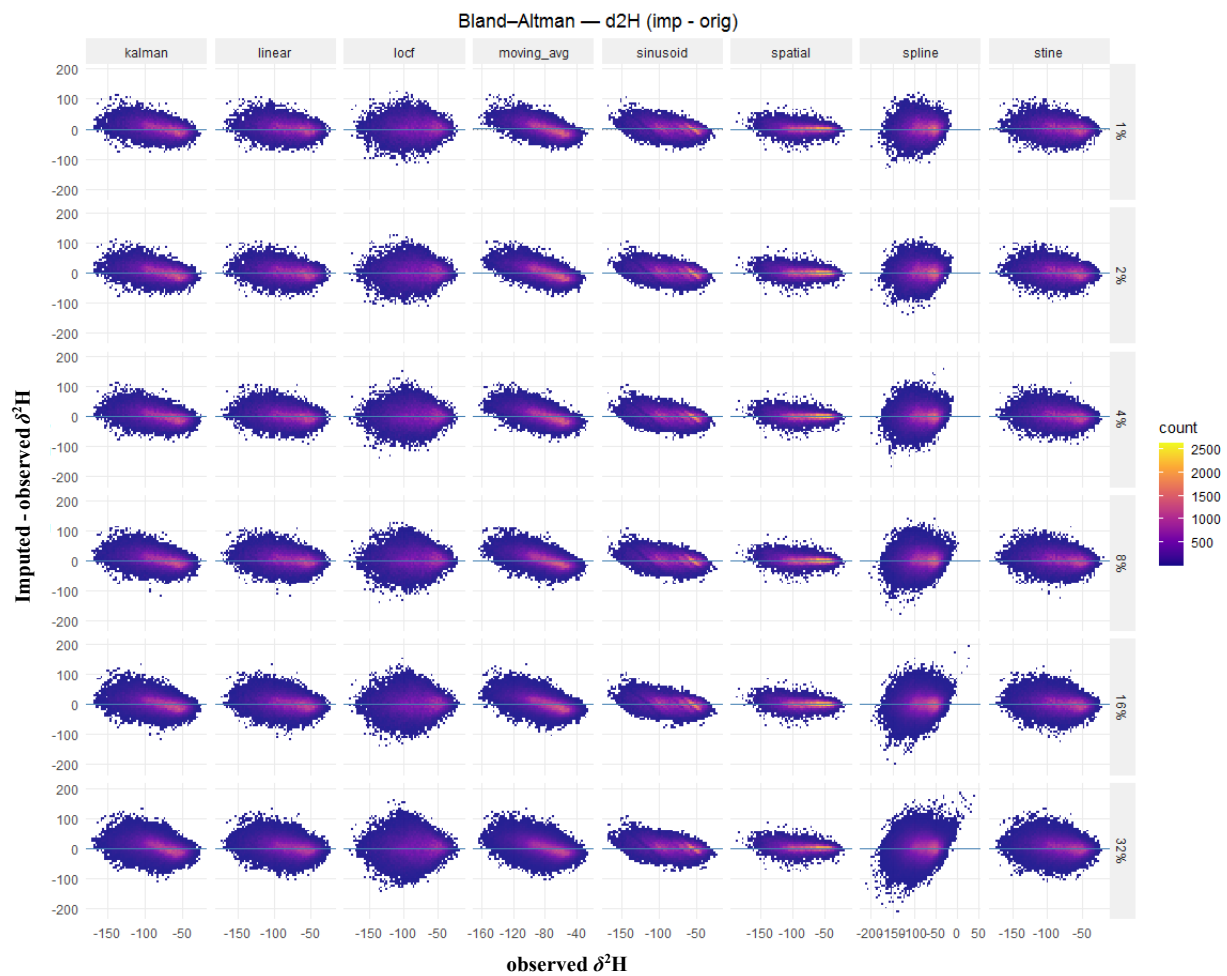

Fig S1. Bland–Altman plots showing the differences between imputed and observed values (imputed − observed) versus the. observed δ^2H value across all masking percentages (X %). Hex-binning is used to visualize the density of points. The Y-axis represents the bias for each point (solid horizontal blue line indicates no bias; positive values indicate overestimation, negative values underestimation). Limits of agreement are omitted for clarity. Results were aggregated across stations and bootstrap replicates for each rarefaction level X.
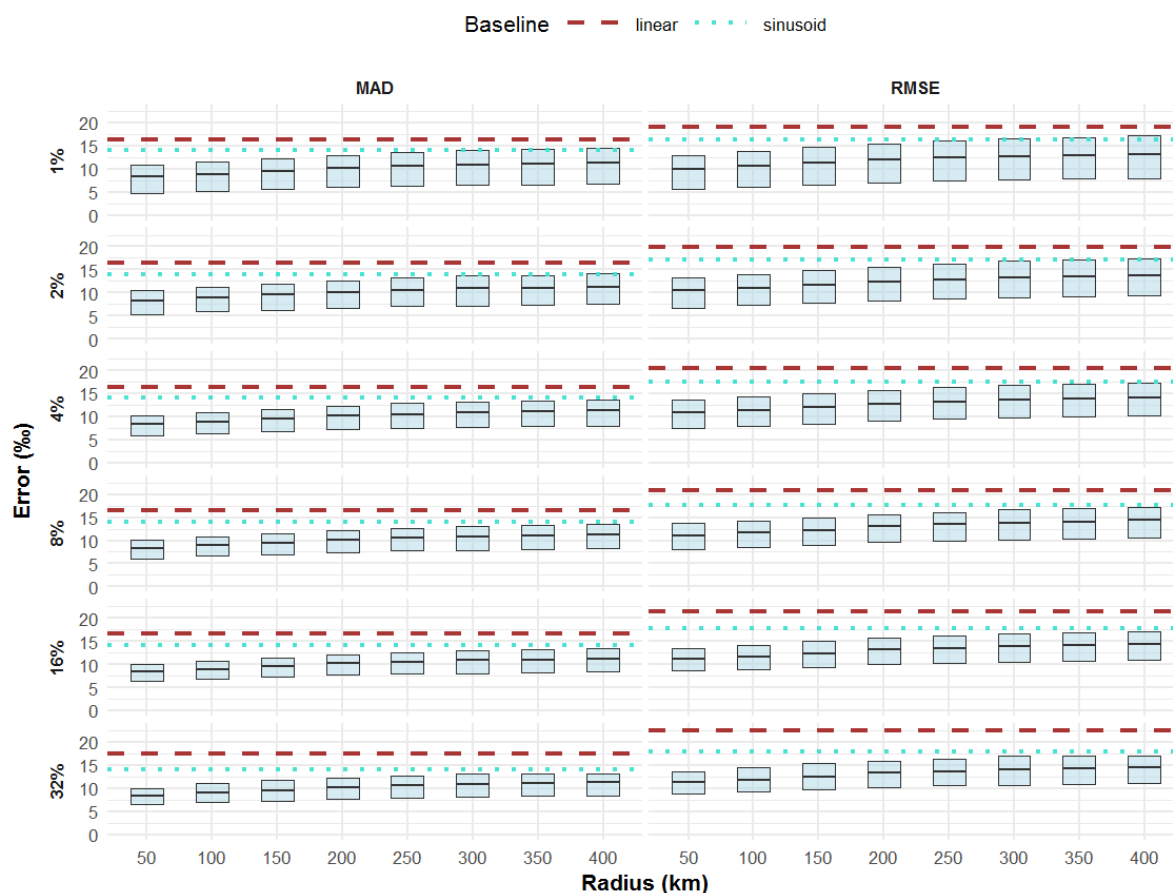
Fig. S2. Comparison of the performance of the SPbI approach using δ^2H values of the surrounding stations in non-overlapping 50 km spatial bands up to 400 km with 50 km increments in a non-cumulative way vs. the mean error of the Linear and Sinusoidal approaches. The Y-axis shows the absolute error of the imputed values, while the X-axis represents the spatial band used for selecting surrounding stations of SPbI. Each box shows the interquartile range (Q1–Q3) of the errors, with the mean represented by the central line. Dashed horizontal lines indicate the mean error of the Linear (red) and Sinusoidal (cyan) approaches.