Supplement for "What controls the stable isotope composition of precipitation in the Asian monsoon region?"

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×10⁴ Multiple Linear Regression (MLR) models with response variable δ^2 H PRESS and R²_{adjusted} of MLR models 0.8 2.4 9.0 adjusted 9.0 adjusted 1.8 **SSER** 0.2 0.6 ۵ 10 20 50 60 100 110 120 30 40 70 80 90 Johnson Relative Weight method 0.8 0.6 22 0.4 0.2 0 30 40 50 60 70 80 90 100 110 120 20 0 100 Proportion of R² 80 60 40 20 n 10 20 30 40 50 60 70 80 qn 100 110 120 T_{AL} • PRESS R²_{adjusted} --- Sum Ratio Line D_{hysplit} Physplit H_{hysplit} T_{hysplit} P_{AL} H_{AL}

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Figure S1: MLR with response variable $\delta^2 H$ and relative importance analysis applied for all possible subsets. The 127 MLR models are sorted according to their R² values in ascendant order. Colors represent the relative contribution (in %) of the predictors. The sum ratio line separates the role of local (in red and orange) and regional (in blue) factors. PRESS and adjusted R² values indicate the quality of the MLR model. The best MLR model depicted by the lowest PRESS (model 124, highlighted by the cyan dot) explains 79% of the $\delta^2 H$ variation (R² = 0.79).



Figure S2: MLR with response variable δ^2 H and relative importance analysis applied for all possible subsets (127 MLR models) for different seasons: a) early monsoon from June to September, b) late monsoon from October to mid-November, and c) the dry season from mid-November to mid-June.



Figure S3: MLR with response variable d-excess and relative importance analysis applied for all possible subsets. The 127 MLR models are sorted according to their R^2 values in ascendant order. Colors represent the relative contribution (in %) of the predictors. The sum ratio line separates the role of local (in red and orange) and regional (in blue) factors. PRESS and adjusted R^2 values indicate the quality of the MLR model. The best MLR model depicted by the lowest PRESS (model 124, highlighted by the cyan dot) explains 30% of the d-excess variation ($R^2 = 0.3$).



Figure S4: MLR with response variable d-excess and relative importance analysis applied for all possible subsets (127 MLR models) for different seasons: a) early monsoon from June to September, b) late monsoon from October to mid-November, and c) the dry season from mid-November to mid-June.