

Interactive comment on “The Global Network of Isotopes in Rivers (GNIR): integration of water isotopes in watershed observation and riverine research” by J. Halder et al.

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We thank referee for the review and comments. Please find our answers below: Specific comments 1: The objective was to analyse the variation of water isotopes in rivers and to compare its variation to isotopes in precipitation. The variation of water isotopes in precipitation is well understood and described in several publications, whereas river water isotope data have not been analysed on a global scale; this is novel. We refer to the Feng et al. study, as that study focuses on local and seasonal variation on a global scale and we did not want to repeat GNIP interpretations. Any data and interpretation of the Feng. et al. study used in our publication is cited. We added “It was

C2229

assumed that the seasonal and local variation of the isotopic composition of river water is closely coupled to the well understood regional and continental isotopic variance in precipitation (Rozanski et al., 1982; Rozanski et al. 1993; Rozanski et al. 1996; Araguás-Araguás et al., 1998; Bowen and Wilkinson, 2001; Feng et al., 2009).”

Specific comment 2: The database and its structure are further explained on the IAEA WISER website. We will consider giving an overview about the detailed data structure in the supplemental materials.

Specific comment 3: Repetition was reduced.

Specific comment 4: in the abstract around page 4055, we do not address the difficulties of the dataset (not resolvable since many data were contributed) but the challenge was to compare the GNIP and GNIR datasets (See p. 4055L6-9). This explains why catchment constrained modelling was applied.

Specific comment 5: The study included watersheds of all sizes. A correlation between catchment size and e.g. $\delta^{18}\text{O}$ amplitude was not found. We agree long-term studies can also help to evaluate transit times or estimate baseflow contributions. Evaluation of transit and residence time is beyond the scope of this publication, due to the spatially and temporally heterogeneous data situation.

Technical comment 1: We will increase the font size – suggest tackling this issue during editing for the final HESS paper.

Technical comment 2: Revised.

Technical comment 3: Replaced “analyses” with “compositions”

Technical comment 4: Delete the “a” mathematical models.

Technical comment 5: The sentence was shortened: “This catchment constrained model modification (CC-RWIP) was used to estimate the average amount-weighted isotopic composition of rainfall in the upstream catchment of a selected GNIR station”.

C2230

Technical comment 6: Rephrased to “Moreover, snowmelt and glacier-meltwater dominated contributions with relatively negative ^{18}O values, mixing with enriched summer precipitation, can also suppress seasonal isotope amplitudes.”

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C2231