We thank the Reviewer for the comments. Our detailed replies are in blue below.

RC2: 'Comment on essd-2025-554', Anonymous Referee #2, 21 Nov 2025

Excellent work! My only concern is regarding the Inverse Correction process. What is the solution process given that there is more precipitation data than observed discharge? is there an averaging process of the rainfall in the basin ? I think this is a similar question to comment 4 by reviewer 1. Thanks !

Thank you for your question on the inverse rainfall correction. It seems that there is more precipitation information than discharge information. However, water travel time distributions are integrated in space and time, and the final results are the basin discharge. Therefore, if basin discharge went through the de-convolution process, the water budget residual errors would be revealed as precipitation uncertainties. In the current version of the inverse rainfall correction, water budget residual errors are distributed in a deterministic way, and it is based on precipitation magnitude at the location mapped by the Lagrangian backward tracking. Therefore, there is no averaging process in the approach, but every pixel gets different corrections based on the rainfall intensity at their location.