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Mean water residence times in the pre-alpine Rietholzbach catchment

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The Rietholzbach catchment is a small, hilly pre-alpine basin in the north-eastern part of Switzerland. Its area is 3.31 km^2 and it covers an altitude range between 682 and 950 m. The area is only sparsely populated and primarily used as pasture land (67 %), on steep slopes the land use is forest (25 %). A hydrological peculiarity is the congruence of surface and sub-surface catchment area. In 1975 measurements were initiated to determine and understand the water balance and its processes.

Isotope measurements of all components of the water cycle started in 1994. The water samples of precipitation, soil water (discharge of a lysimeter), ground water, and river water are taken approximately bi-weekly. All samples are prepared by the CO_2 gas equilibration technique and are analysed in terms of the oxygen isotopes by mass spectrometry.

The samples are taken either at the gauge at the outflow of the catchment or next to the main measurement site in the upper third of the catchment where an other gauge, three groundwater wells, the lysimeter and the meteorological sensors are installed in close vicinity.

Based on these data series this contribution will present estimates of the mean water residence times in the different components of the catchment.