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Hydrology and Earth System Sciences Discussions

Interactive comment on "Hydrochemical analysis of stream water in a tropical, mountainous headwater catchment in northern Thailand" *by* C. Hugenschmidt et al.

Anonymous Referee #3

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This manuscript presents a hydrograph separation study based on electrical conductivity and the measurement of different ion concentration. The study was performed in a tropical catchment. Since such hydrological process studies in such tropical areas are still limited, the study could make a contribution. However, the paper needs MAJOR revisions before it might be acceptable for HESS.

The authors discuss the hydrochemical signal only with respect to possible vertical variations of flow pathways. However, one has to be aware the fact that this is no hillslope study, but the measurements come from a 7 km2 catchment where the stream signal is most likely (also) affected by different parts of the catchment contributing with

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varying amounts during events. Is there any information on how soils, vegetation, geology, topography, . . . vary within the catchment? How much does the stream network extend during the rainy season (I assume not all small streams are shown on fig.1., are they?)

Interflow: I miss a clear definition of what the authors mean by the term 'interflow'. Also the sampling of the interflow component remains unclear to me: The authors describe this shortly (p. 2193, 12ff), but there is no information on at how many foothill locations these samples were taken. The same applies to sampling of the surface runoff component. Where? How many locations? This is important information as I would assume some significant spatial variation in the 7 km2 catchment. Can we assume that the one (?) or more sampling sites were representative.

The data base used in this manuscript is rather small and the authors should be careful when making conclusions. Three events in a single catchment do a limited amount of information. Honestly, I am afraid the general measurement design was far from perfect, and this might limit what one might be able to do with the data. As a minor issue, I was surprised that there was no precipitation gauge inside the catchment, why??? Has there been any attempt of hydrometric measurements inside the catchment? While the pesticide issue might be a motivation for this study, I find the parts about pesticides (especially in the conclusions) highly speculative. Do you have any data on pesticides during these events?

The tracers used cannot necessarily be assumed to be conservative tracers. Why were no isotopes (O-18 or D) used?

Fig 1 is of poor quality. Please only show what you use in THIS study.

Fig 3: Is there any explanation for the high variation of some concentrations BEFORE the event? The authors state that these "were probably caused by an earlier event". But was there such an earlier event? It is not seen in the runoff data . . .. And if, wouldn't such delayed effects of previous events invalidate the entire hydrograph separation?

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Fig.8/9 & table 2: please also show the uncertainties in these estimates.

Fig 10: is this needed?

Table 1: How many samples?

The language needs to be improved.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 2187, 2010.