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Interactive comment on "Water and sediment fluxes in Mediterranean mountainous regions: Comprehensive dataset for hydro-sedimentological analyses and modelling in a mesoscale catchment (River Isábena, NE Spain)" *by* Till Francke et al.

Anonymous Referee #1

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General comments: The paper by Till Francke et al. presents a dataset of hydro-sedimentary and meteorological data in a Mediterranean mesoscale catchment of North-East Spain (the Isábena catchment, 445 km2) comprising 5 instrumented sub-catchments ranging from 25 km2 to 146 km2. The dataset covers the period 2010-2016. It is interesting because there are few observation systems focused on discharge and suspended sediment fluxes in mountain mesoscale catchments in the Mediterranean region. The data provide mainly from the SESAM project and also from the Uni-

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versity of Lleida and the SAIH operational network. This kind of data is very demanding to collect over a period of several years in such a network of hydrosedimentary stations since moutainous rivers are very dynamic geomorphological objects. Hydrometric and suspended sediment monitoring require regular observations in the field (gaugings, sampling) and significant amounts of samples to be collected after floods and analyzed in the lab. For the precipitation forcing, the authors have included data a network of 12 rain gauges deployed during the SESAM project and data from 2 rain gauges managed by the University of Lleida as well as 6 rain gauges managed by the SAIH operational network. For the other meteorological variables, the data come from the operational stations of the SAIH. All the data presented in the paper are easily accessible via the link proposed by the authors: http://doi.org/10.5880/fidgeo.2017.003. The data are in public access. However, the link to the CUASHI database does not work (http://hydroportal.cuahsi.org/isabena/cuahsi_1_1.asmx?WSDL). Overall, my opinion on this paper is contrasted. I think there is a potential, but the dataset selected seems to be of variable quality and some parts are missing, especially on the spatial descriptors. The authors highlight the value of this dataset for the evaluation of hydrosedimentary models, but no information is provided in the paper on the physical characteristics of soils to describe the hydrology of the catchment. The only information available are the spectral properties of surface soil samples used for the fingerprinting of suspended sediment. Similarly, there is no DTM or land use map provided while they are required to apply a distributed model. Regarding the presentation of the observation network, I did not find all the information I needed in terms of maps and tables to get a precise understanding of the instruments in place and their location. Figure 1C should be improved and completed. It is quite requiring for the reader to locate the points of measurements and what is really measured at each location. At the moment, it is necessary to enter deeply in the dataset to extract this information. In Figure 1C for example, there are too many red dots compared to the available dataset, so we get lost. I counted 18 red dots, while there are 6 rain gauges from the SAIH available in the accessible dataset. Furthermore I counted 11 black dots while 12 rain gauges are

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listed in the paper for the SESAMII project. It is not easy to know where the different meteorological variables are measured. It would be important to find a way to add the names of the measurements points or at least a reference. It would also be nice to distinguish between "research" data and operational data in the Tables. Table 2 should be completed as well with the drainage area of the sub-catchments, the name of the rivers on which the measuring stations are located and the instrumentation deployed at each measuring station as it is the core of the dataset. It would be nice to add information on these stations in the dataset such as photos and the bathymetry of the cross-sections. I wonder the relevance of the choice of the selected period (2010-2016) presented in this study. I have the impression that this choice depends mainly on the deployment of the rain gauge network of the SESAMII project. However, the authors do not discuss about the density of rain gauges in relation to the size of the Isábena catchment and the gradient of altitude to determine if such an observation network is suitable to catch the spatial variability of rainfall in this mountainous Mediterranean environment. My feeling is that the density of the rain gauge network is variable over the catchment area and therefore the spatial variability of rainfall is only partially taken into account. Looking in more detail at the time series of precipitation, discharge and suspended sediment concentration, I realized that there was a decrease in data quality and completeness from the end of 2013: more gaps are visible in the time series of discharge and suspended sediment after this date and the sediment samples are not so well distributed in time to cover completely the floods. When reading the articles already published by the same authors about the Isábena catchment, I realized that the period 2005-2010 seemed of better quality in terms of discharge and suspended sediment times series compared to the 2014-2016 period. So, why not include in this paper the period 2005-2013 and think about the relevancy of maintaining the period 2013-2016? Continuous time series are particularly required to establish water and sediment budget. That would be fine also to add some information on the diversity of events observed during the period in terms of return period (at least for SAIH precipitation rain gauges and discharge at the Capella station where there are longer time series).

More specific comments on the dataset: Precipitation data: I would propose to organize the data in sub-directories according to the producers (SAIH, U. de Lleida, SESAMII). There is too much heterogeneity in the format of the data. It is certainly interesting to provide data at the time step of the tipping bucket but it does not seem enough to me. The data should also be provided at a fixed time step, common to all the measurement points (at least the research rain gauges): 1 'or 5'. This would highlight possible periods of gaps and make easier for people who are not used to manage files at the time step of the tipping bucket to have a quick overview of the data. Times series should also all start and end on common dates (example: 01/01/2010 00:00 and 31/12/2016 23:55) and include all the time steps (the lacking values should be indicated by -9999). For Villacarli, there seems to be 2 rain gauges at the same place. It is not explained clearly in the text and it is probably the reason why there are 11 black dots in Figure 1 instead of 12.

Other meteorological data: It is not clear where these variables were measured by reading the paper and looking Figure 1C. Is their location relevant for the Isábena catchment which is located in a region of important gradient of altitudes? There seems to be mainly temperature measuring stations compared to the other variables but are they able to account for the effect of altitude ?

Calculated discharge data: There are 6 stations including 5 stations belonging to the SESAMII project and 1 station ruled by SAIH (Capella). Temporal resolutions are 1, 5 or 15 minutes. Regarding the data at the time step of 5 min, I was surprised to find out that the data are not necessarily stored for multiples of 5 min (3, 8, 13, 18, 23... instead of 0, 5, 10, 15, 20, 25, 30, 35...) and it can change over time. In addition, there are sometimes changes in time steps. It would be appropriate to build files with fixed time steps that also include gaps with value of -9999. For Villacarli, there is a change from a time step of 5 min to 1 min on 22/11/2011 within the same time series. As for rainfall, time series should all start and end on common dates. Regarding the stage-discharge rating curves, I questioned the difficulty of maintaining the ratings in

gravel bed rivers which are considered as moving-bed rivers. The authors make no comment on this difficulty while it constitutes an obstacle for the scientific community at the moment. How are managed the problems of successive shifts in rating curves resulting from the changes in cross section geometry? The BaRatin tool (Le Coz et al., 2014) that was used in this study does not handle shifts in rating curves. It should be applied to independent periods associated with a stable rating curve. In addition, I wanted to carry out a few verifications of discharge contribution from sub-catchments to the whole Isabena catchment at the scale of the flood event. I selected randomly two events: the 03/04/2014 and the 03/11/2015 but there were too many gaps and it was not possible to perform such a test.

Discharge measurements: These data must be clearly separated from the calculated discharge time series since they correspond to direct measurements. The discharge measurements should not appear in Table 1. In addition, in the "discharge_metering.csv" file, it is essential to add the value of water level for each gauging since it is part of the measurement. The authors should be careful since there are some negative values in this file? Additionnaly, since there are no gaugings at very high water, it is important to explain according to which hypothesis the rating curves were extrapolated? If it is derived from BaRatin, the different hydraulic controls should be listed in a table and the cross-section should be added in the dataset.

SSC data: generally there are less samples after mid-2013 and lower concentration values, what is the reason for such a behaviour? In the methodology section of the paper, it is not explained how turbidity-SSC rating curves were derived. Are they general rating curves or specific to each flood event? How are the data processed in the absence of collected samples? Capella_turbidity_1.csv: bad signal from June 2014 Capella_turbidity_2.csv: negative signal permanently

Specific remarks on the text: Some bibliographic references are not present in the list while they are quoted in the text. p.6 l.9-11: not clear the number of weather stations. p.7 l.14: on what criteria are the data criticized? p.7 l.15-19: is there a possible expla-

nation for this phenomenon? p.9 l.22: replace Vwater with Vmixture p.12 l.19 : replace http://doi.org/10.5880/fidgeo.2017.03 with http://doi.org/10.5880/fidgeo.2017.003

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