Comment on essd-2020-363
Anonymous Referee #2

Referee comment on "STH-net: a model-driven soil monitoring network for process-based hydrological modelling from the pedon to the hillslope scale" by Edoardo Martini et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-363-RC2, 2021

The paper is generally well written and presented and describes a dataset will be useful for many wishing to understand soil processes better. A have some general comments and specific points which I have made below.

General comments

I am not sure the title for the paper is suitable. The title says the monitoring network is model driven, to me this suggests you used a model to find areas of highest uncertainty and instrumented these. How about shortening to “STH-net: a soil monitoring network for process-based hydrological modelling from the pedon to the hillslope scale”

Seems to be a lot made about the high resolution data collected at 10 minute intervals, yet the data set is averaged to hourly – not sure why this is. A user can average up if they need but they can't disaggregate once you present averaged data. 12 hour smoothing and hourly averaging may remove a lot of important information, particularly around rainfall events when responses are quick.

The section on groundwater level measurement is very sparse. There are no details of the
type of sensor used and no corresponding figure like the other sensors types get. This dataset also appears to be missing on the data sharing site. Details need to be improved and data added or any mention of the piezometers should be removed.

Has the accuracy of the WXT520 rainfall been assessed in any way? My experience in using such sensors shows that they work well in some climate conditions and not in others. Seeing as the rain is the primary driver of any modelling it is important to establish this as an accurate measure. These devices have been tested by others and show not produce some serious over-estimates (see Basara et al 2009)

Specific comments

L13 – change to “…dynamics are being…”

L29-31 – sentence needs to be reworded or split in two so that it makes sense

L35-36 – reword to “hence numerical models are needed for the comprehensive representation of the system state and fluxes so that the hydrological system can be better understood.” ???

L38 – change remarked to noted

L41 – makes no sense. Delete ‘however’?

L56 – change remarked to noted

L71 – change to “…aim to provide physical models…”

L131 – delete safety
L134-135 – suggest change to “The TDR probes were custom made and have three 0.2 m-long rods. They were calibrated through measurements in air and in water...”

Refs