

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2021-77

Anonymous Referee #2

Referee comment on "Cosmic-Ray neutron Sensor PYthon tool (crspy 1.2.1): an open-source tool for the processing of cosmic-ray neutron and soil moisture data" by Daniel Power et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-77-RC2>, 2021

This paper describes an open-source python tool called crspy that is designed to facilitate the processing of raw CRNS data into soil moisture estimates in an easy and harmonized way. Although the tool I think is useful, more explanations about the data inputs and data fusion methods and the applications and comparisons with other existing models are needed. Please see my comments below:

The spatial mismatch between the ERA-5 land and the CRNS datasets is quite large (0.6 km vs 9 km). Before applying the ERA-5 data directly into your modelling, has the data been evaluated against the in-situ data first? For users/readers, it's useful to know this information.

Can you explain more about how the ERA-5 data are used for filling in the data gap? Which data fusion method is used in your tool? How did you tackle the spatial mismatching issue?

It is stressed by the authors that the intention of the work is not to identify which method is better or worse than the other. This is a bit confusing as if we (users) don't know the comparative performance, how can we be confident in choosing your model. They can choose a more accurate model which I think is as important as the harmonized step.

Pg 10-11. "The data required for the calibration step includes the date of volumetric soil moisture of the sample." Where are the sensor's calibration data from? Are these the information already available with all the existing Cosmic-Ray sensors around the world?