

Interactive comment on “Estimation of subsurface soil moisture from surface soil moisture in cold mountainous areas” by Jie Tian et al.

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1. The aim of this study is ambiguous. Is it comparison of different methods, improvement of methods, or evaluation of satellite products? 2. Does the ExpF method with optimum T_{opt} perform better than the ANN? If not, why does the author apply the ExpF method to expand SMAP? 3. In the introduction, the author mentions there are four groups of methods, what are their advantages and disadvantages? Why did the author choose the three methods in this study? 4. In section 4.1, there are lag time between soil moisture data at different layers and at surface. How did the author consider the impacts of the lag time in applications of these methods? 5. The performance of the ANN method is significantly related to the training data. In this study, 70 % data was used as training data according to Zhang's study. However, Zhang's study focused on

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the US., is 70 % suitable for the high mountainous area? Moreover, even with a ratio of 70%, there are lots of data combinations, what's the principle to choose these data? Does the author compare the performance of the ANN method with different data combinations? 6. In section 4.3.2, T_{opt} is estimated by precipitation and clay ratio. However, the main advantage of the RBF method is its requirement of few data in introduction. Thus, the improvement in this study is meaningless. What's the insight of this improvement in other regions? 7. The author evaluates both SMAP_L3 and SMAP_L4 products against in situ observations. The SMAP_L4 is the assimilation results of satellite data and model simulation. What's the impacts of their original biases of SMAP_L3 and SMAP_L4 respectively? What's the impacts of scale-mismatch between footprint scale of satellite products and point scale of in situ observations?

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