Comments by Bin Peng (112233pengbin@163.com or pengbin@radi.ac.cn)

The work presented by this paper is of great value to the land surface modeling community. As the authors state in the introduction part, time series with no interrupting gaps are required to force the physical models at site scale. Gap filling is essential while time-consuming and there is no generally accepted standards to achieve the goal. The paper describes their algorithms using the ERA-Interim data to filling the gaps in the surface meteorological forcing variables measured at FLUXNET sites with plenty of details which makes the work reproducible. Therefore, I think this paper would be a valuable contribution to ESSD as well as the land surface modeling community and only some minor changes are needed.

Besides this general comment, I have a confusion about the presentation of section 3.2 and Fig. 4. What does the "diurnal signal" mean? Considering the backgrounds in section 2, I would like to believe the authors do the statistics with all available "good" (fqc==0) half-hourly observations and the de-biased and downscaled ERA-Interim data. If this is true, I would prefer "half-hourly signal" to "diurnal signal" since the WS and LWin would not display significant diurnal variations. Or the authors do the statistics with each full diurnal cycle data and then average the statistics metrics for all days? I suggest the authors give more details about the statistics in this section.

Regarding with the dataset provided on the website, I have made a first try to use this dataset and I'd like to report one exception about the LWin_era at FR-LBr sites. I come across unexpected high values at this sites and there may be a small scaling error during file writing process. Another concern is about the hours shifting to UTC time at some sites, such as BE-Bra, BE-Jal, …. As the longitudes fall in [-7.5, 7.5], there should be no time shifting, right?

I would also suggest the authors to add the surface pressure variable in their dataset and extend the time series beyond the yeas of available FLUXNET observations as spin-up process is generally needed in land surface modeling.