Comment on essd-2021-302
Anonymous Referee #1

In this manuscript, the authors developed a global dataset of annual urban extents (1992–2020) using consistent NTL observations and analyzed the spatiotemporal patterns of global urban dynamics over nearly 30 years. The urbanized areas associated with locally high-intensity human activities were mapped from the time-series global NTL imagery using a new stepwise-partitioning framework. The research is significant and meaningful for improving the understanding on global urbanization. My suggestion is minor revision before publication. The comments are presented below.

1. How do the authors determine the urban boundary rather than the impervious surface area boundary? In fact, the urban boundary should include the impervious surface region and the permeable surface regions such as green park, water body and bare soil inside the urbans. However, there are many missing land types or hollow areas in the urban boundary of this manuscript such as Figures 6 and 8. Also, we check the dataset (the global time-series urban extents is available at https://doi.org/10.6084/m9.figshare.9828827.v5 in this manuscript) such as annual_urbanMap_global_2009.tif. In this dataset, the urban boundary is still not a complete and contains many hollow regions inside the urbans. This is a minor problem from the subjects of remote sensing and geography.

2. Line 136 “identification of optimal thresholds to delineate annual urban extents”. So, a threshold attachment to identify urbans at the national or regional scales should be provided in the manuscript so that the scholars can accurately repeat the data production process.

3. Line 144 “local areas include urban cores, suburban and rural areas?” How to identify urban cores and suburban is lacking in this manuscript.