This paper describes a tool called ISAT (Inventory Spatial Allocation Tool) v2.0, that was developed to configure nested domains, downscale regional emission inventories, allocate local emission inventories, and generate model-ready emission inventories for the Weather Research and Forecasting (WRF) coupled with Air Quality models. The model is described and freely accessible on a github repository. An application is proposed over a region of China.

My general impression is that the paper deserves to be published with some adjustments in the description of the steps in the core manuscript. I appreciate the fact that most of details are reported in appendices but probably more explanations are needed in the core of the paper. Sometimes the description is a bit cryptic or too elliptic. In general the English is fair and correct, but some part needs to be rephrased.

Major comments

My first major comment is to reshape the presentation to better identify the 4 steps in the abstract after in the publications in the subsections.

My second major comment is to show that this pre-processing is mass conservative, some numbers and a section dedicated to the test of mass conservation are needed. It can be short, but the author must inform us about the quality of the downscaling in terms of mass fluxes conservation.

Third, the downscaling methods should be compared with an independent bottom-up emission inventory. I know that fine scale emissions database exist over the BTH, it will be relevant to compare this methodology with a reference expected to be the closest as possible of the true. It seems the authors compare two different downscaling methods which is not relevant in my opinion.

At last the authors must inform us about the type of proxy that are adequate with precursor pollutants. For instance, for ammonia emissions, crops or other spatial proxy will be more appropriated. A table summarizing the proxy for each main precursor should be added in the core of the paper.

Minor comments

L31 to L36: The sentences are not correctly written, please rephrase. Some words are missing!

L43: please provide a reference here for the "nearest method"

L60-66: Rephrase this part to describe the content of the paper. The last sentence is not necessary as it is already said before.

L70-71: I do not understand this statement: "The shapefile for the study area was a basic nested domain configuration file with determinate regional attributes for grids".

L72: what do the authors mean by "inline"?

L79 : which nested rules ? be more specific

L87 : the concept of add_* is a bit difficult to understand, please clarify

L91 : what LCC means ? In general review all acronyms to make sure they are defined

L94-98 : Please use bullet points to clarify the various steps.

L117 : I my opinion equation 8 can be simplified, the second line should cover the case in the first line.

L118 : *int* is the « integer part » function, please mention it

L174 : what do the authors mean by « census » here ?

L180 : Please provide the meaning of GIS.

L185-186 : the last sentence needs to be reformulated, it is difficult to understand the wording « demand »

L188 : what is the resolution of MEIC here ?

L189 : if I understand well, the authors compare MEIC downscaled by their routine with an independent BTH emission inventory ? right ? It is not clear is this section what the authors are comparing.

L200 : what do the authors mean by «uncertainty in the boundary » ?

L207 : could the authors extend the analysis on other precursors emissions like NH3 that have a complete differrent spatial pattern ?

L237 : what are « oceanfiles » ?