Follow up review of manuscript MN-22-1794-MJ

I would like to thank the authors for the implementation of some of my suggestions and for the clarification of my doubts. I think the manuscript is now much nicer to read and I have seen an improvement in the quality of the figures. I recommend it for publication after these few minor final comments are addressed.

General   Thank to the referee for his very careful !   Il a vérifié attentivement toutes les figures!

- Please next time be more careful with colors in figures. I have found plenty of non-corrected ones. One or two is totally inside error tolerance but with such a long list of authors, these type of dirty work should not be left to the reviewer.
- Please try to homogenize more the spelling of words: mid-latitude vs midlatitude etc
- I think there is space for improvement in the clarity of the legend of the plots.

Abstract   OK , something like L mode mixing, i.e. map distortions due to frequency dependent instrument response
Thanks for improving the last sentences. Please consider adding few words to explain the concept of mode-mixing. Remember homogenize spelling (there is a mode-mixing and a mode mixing).

A   mode mixing (no -) and mid-latitude (with dash) ?

1. Introduction

The caption of Table 1 still contains a reference to autocorrelation that is left there to float with no explanation.   Not sure which reference is meant ??
The latest detection of MeerKAT single-dish Hi intensity mapping cross-correlation power spectrum with WiggleZ galaxies (https://arxiv.org/abs/2206.01579) could be added to the table (although the paper is not

B   published yet).   We can add this arXiv 2206.01579 to the table -Maybe the referee is one of the authors ?

2. Low redshift surveys with Tianlai

I still do not really see the point of having both equation (1) and (2). Equation (2) and its derivation is already present in multiple papers (e.g. Santos et al. 2017, Bull et al. 2015) and factors $(1+z)$ more than the ones in equation (1) are only due to the definition of $\delta\theta$ (if at z=0 or not) and of σT.
It could be useful to keep the Appendix A but please:
-avoid using $F(k_x,k_y,k_z)$ without defining it or please define it explicitly
- σT is used to denote both pixel noise at a generic redshift and at z=0. Please be more careful.

OK, we remove equation 1, and adapt the sentence . We can add Bull et al. 2015 , which is already in the list of references   C
here, however, I did not found this explicit form (which is in Ansari 2012) in Bull et al 2015
Page 4 – Line 15

"as it appears" is confusing. It should say explicitly that this is a simulation since a spectral index is assume to scale Haslam and NVSS to the frequency of interest.

OK, we can change the sentence and adapt the 2nd paragraph in page 4 (left column) , and reference section 3.1, instead   D
of » combination of the Haslam map …. «
The explanation of the foreground modeling appears both here and in section 3.1 What I was already suggesting in the first review was to keep it only in section 3.1 to avoid duplication.
A brief reference to 3.1 would be enough when the left panel of figure 2 is introduced.

3. Planned surveys, simulation and analysis

Page 5 -line 41 – second column
The expression beta~-2….-2.5 is still there and unclear. The author have clarified its meaning in their answer

E   to my comment but not in the paper.   OK, let's put the same sentence in the paper

3.3 Foreground subtraction

Notation is unchanged despite the authors wrote "notation changed" in their reply. The notation can be kept as they prefer but their reply should have been consistent with their choice.

Indeed, we should have said : notation clarified in the text
The red data in Figure 6 have a (x) in the legend but are represented with a triangle.

F   OK, update figure 6 (or its legend)

G The legend for the addition of noise is different between figure 7 and 8 (Noise vs +Noise)

OK, let's write +Noise also in figure 7

Figure 10 should come after figure 9.

I guess LaTeX has done this - check what we can do

4. HI clumps detection

For Figure 11 and Figure 12 it would be better to use something like "low noise" consistently with the text and Table 5 instead of "scaled".

H OK, we can replace scaled by low noise (ce n'est pas bien d'être honnête …)

In Figure 11 the dots are orange and not red.

If I understand correctly from the text the low (scaled) noise case is done with P instead of DF. If the authors do not want to add too much info in the Figure maybe they should consider adding a sentence to say that different cleaning methods are used but results do not change much?

Also, would not be better to say "source" detection efficiency instead of "HI clump" given there is no HI involved at this point? NO, we say that we have used the DF method, which induces higher noise level than the P method here. check text page 12 top left, page 11, bottom right

I Pag 11, line 47, second column. As reported in table 4 instead of 5? The knee mass are reported in table 4.

NO, I think that the text refers to the numbers in Table 5. Check the text page 11, right column, below the Table 5

Figure 12. It would be better to use the same blue and the same linewidth for both panels, to help the reader doing the parallel between the two figures.

I guess it is the same blue, but not the same linewidth…

5. Cross correlation with optical galaxy catalogs

Page 14 – line 16 .. → .   I don't know where is this

Figure 15 – please say explicitly cross-correlation between what and what in the caption and be also more explicit in the text (pag 14, line 25, second column). The lines in the Figure are presented in reverse order in the text with respect to the legend. Homogenizing the order of the legend with the text it is of great help for the reader.

J OK : add C_l^x definition in parathesis for example in Fig caption, and in the text, just below the Fig. 15 , page 14, 2nd column

Figure 16. Its content has changed wrt the old version. Could you please clarify to me why?

The color in the caption are all wrong. To be more consistent with previous figure I would add "no fg. Sub" to the corresponding case instead of adding "fg. Sub" to the other two.

K Change in the ell-range and Y-axis scale

When referred in the text (pag 15, line 32), the black line of Figure 16 is described as orange. Please change.

L YES, the last sentence in the second paragraph of page 15 (left column) mentions « orange «

Description of Figure 17 (pag 15, line 48) should restate that cleaning is applied again at this stage.

Thanks for answering to my point of the highest redshift bin. I suggest you incorporate that answer in the paper.   OK, je suppose qu'il veut qu'on mette dans le papier « Taking the uncertainties (as shown by the error bars in the shuffled case) into account this is not much of an issue .

Description of Figure 19 (pag 16, from line 51) has again all colors wrong. The HI only case has yellow/orange stars and not red ones. HI plus noise is magenta circles and not blue ones. The all comp. plus noise is with blue triangles not magenta ones.

To be consistent with previous figures I also suggest to use cyan for the shuffled case (or even better, gray everywhere).

M YES, the referee is right , the colors are not correct in the text, last paragraph, page 16, left column

Figure 20. Please check blue dot outside the x-axis range. Label for the y-axis should be the same as Figure 19. I suggest to use a lighter notation for δ>86 deg (something like smaller area or 4 deg).

In the caption I would use the same notation as for Fig 19 for the frequency interval (bin 3)

I don't know what is the blue dot outside the x-axis range ??   **N**