

## Mapping the kinetic Sunyaev-Zel'dovich effect toward MACS J0717.5+3745 with NIKA - Second referee report

Dear referee,

Thank you for your comments and corrections. Please find the answers below. The changes have been made in bold face in the text.

Best regards.

Rémi Adam, Iacopo Bartalucci, and Gabriel Pratt, for the NIKA collaboration.

The authors provided detailed answers to the first report and incorporated them partly in the revised manuscript. They have resolved some of my concerns, while there still remain a few points that would require further clarification or revision. I think the paper can be accepted for publication once the following points are resolved.

1) Figure 1 now indicates that the noise at 260GHz is correlated over the spatial scales much larger than the beam size, which might give rise to spurious signals at the scale of subclusters. The authors should clarify to the readers that the power spectra of the NIKA map and the difference map are indeed distinct at these scales and the reported S/N is correct.

Precisions have been added concerning the noise spatial correlation. Indeed, the SNR contours of Figure 1 are given at a scale of  $22''$  FWHM and account for the spatial noise correlations.

2) While the authors state in their reply that "Concerning the quoted significance values (e.g. 5,1 sigma), we stress that this is not related to the fit or any modeling of the cluster.", the confidence limits and the errors presented in Figure 8 and Table 6, respectively, appear to be derived from the (statistically unacceptable) fits and not meaningful for subcluster B. Alternatively, assigning the significance values of  $y_{\text{kSZ}}$  to the velocity is not appropriate either, given large uncertainties in the optical depth. They simply indicate optimistic limits of the true significance of the inferred velocity. I recommend the authors to make this point clear not only in the text but also in the captions whenever such values are used in figures or tables.

Indeed, all the uncertainties we present on the velocity are model dependent, and this model is clearly limited. We have added precisions concerning the significance of the various constraints we show in tables and figures.

Concerning the velocity map, a kSZ detection is equivalent to a gas velocity detection (in term of detection significance). Then, of course, the uncertainties on the velocity map are also strongly affected by the uncertainties in the model of optical depth. This is discussed in the text and we have stressed this point in the caption of figure 9.

3) The following statements in Section 6.4 are not supported by the results of the paper and I suggest removing them. The deviation between the data and the best-fit model using the X-ray imaging is more than 3-sigma at the sky position where the highest S/N is reported for  $y_{\text{kSZ}}$ .

- "This indicates that the SZ data as described by our model are not in major conflict with the X-ray imaging."

- "In summary, our gas model provides a fairly good description of the data,"

The two sentences have been removed.