**Response to the referee reports:**

We would like to thank the referees for providing valuable comments on our manuscript. According to these comments, we have revised our manuscript. We thank Referee 1 for directly recommending the paper for publication. We also thank Referee 2 for raising such useful comments and suggestions, helping us to significantly improve the quality of the paper. In the following, we shall respond the comments of Referee 2 one by one.

Comments from Referee 2: “The manuscript investigated what role the SKA neutral hydrogen (HI) intensity mapping (IM) sky survey observation will play in weighing neutrinos in cosmology. The topic and the results are interesting. Before being accepted, some of the essential points needs to be verified or revisited.”

Comment 1: I suggest the authors to clearly state the differences between the results in the current manuscript and those in the existed literature, such as Ref. 33-35. This will help the reader to digest the essential message of the current manuscript.

Our response: We thank the referee for providing such a helpful suggestion. To respond to this comment, we add 6 points to clearly state the differences between our work and these previous works; see the last second paragraph in Sec. III (Pages 6 and 7).

“The differences between our work and these previous works are mainly embodied in the following points: (i) We use the SKA mid- and high-frequency observations, not the low-frequency of EoR observation. (ii) We use the HI BAO measurements, but not the full HI power spectrum, to make cosmological parameter constraints. (iii) In the cosmological fit, we use the MCMC method, instead of the Fisher matrix method. (iv) In the cosmological analysis, we do not assume a detection of the neutrino mass, but only consider upper limits on the neutrino mass. (v) We investigate how the 21 cm observations from SKA can improve the constraints on cosmological parameters (in particular, the neutrino mass) on the basis of the constraints from the current CMB+BAO+SN data. Note here that using the current mainstream cosmological observations (CMB+BAO+SN+H0), the cosmological parameters have been tightly constrained. (vi) We make discussions for the NH, IH, and DH cases, respectively. Here, it should be emphasized that we do not use the 21 cm observation to distinguish the neutrino mass ordering, but only consider the constraints on the total neutrino mass in the three cases of neutrino mass ordering.”

Comment 2: Based on the previous results, such as Ref. 33-35, we can generally conclude that NEITHER SKA1 NOR SKA2 could distinguish the NH and IH of the massive neutrinos. Hence, I suggest that the authors demonstrate the motivation of the current research.

Our response: We do not wish to use the 21 cm observations to distinguish the NH and IH of the massive neutrinos. Actually, we only discuss the constraints on the total neutrino mass in the three cases of neutrino mass ordering. To respond to this comment, we also add a sentence in Page 7 (see also the last sentence in Response 1): “Here, it should be emphasized that we do not use the 21 cm observation to distinguish the neutrino mass ordering, but only consider the constraints on the total neutrino mass in the three cases of neutrino mass ordering.”

Comment 3: Based on the content, I understand the authors used the mock data from the Ref. 5 to estimate the parameters. However, the mock data from Ref. 5 is not a simulation data, but a Fisher forecast. I suggest the authors to describe more details of the datasets they adopted. Furthermore, I suggest the authors to write clearly the likelihood formula of the 21 IM data. Since the H(z) and DA(z) are intrinsically correlated, it will be helpful for the readers to understand how the authors take this covariance into account.

Our response: We thank the referee for providing such a helpful suggestion. First, the HI BAO data used in this work are indeed obtained by using a Fisher forecasting method. But, in the cosmological fit, we use a MCMC method, rather than the Fisher matrix method, to infer the posterior probability distributions of cosmological parameters. Second, in the actual optical BAO measurements, H(z) and DA(z) are indeed correlated, and thus in the likelihood function the covariance for them should be considered. However, in the forecast for 21 cm observation, we have assumed that H(z) and DA(z) can be independently measured, i.e., no correlation between them, which is accordant with other investigations. To respond to this comment, we add a new paragraph and rewrite a paragraph in Sec. II (Page 3).

“The expected BAO measurements by the SKA have been forecasted in Ref. [5], based on the Fisher forecasting formalism developed in Ref. [32]. For SKA1-MID (IM), the experimental specifications used in the forecast are given in Table 2 of Ref. [5]. For SKA2, only a galaxy survey is considered in the forecast, although actually an IM survey based on a mid-frequency aperture array should be able to provide similar BAO signals out to z=2; the number counts used in the forecast can be found in Table 1 of Ref. [5]. The expected relative errors of H(z) and DA(z) in the BAO measurements by the SKA, using the Fisher forecasting method, are given in Fig. 3 of Ref. [5].”

“In this work, we directly use these forecasted HI BAO data of SKA presented in Ref. [5] to make an analysis for the cosmological parameter constraints. In the cosmological fit, we use the Markov-chain Monte Carlo (MCMC) method, rather than the Fisher matrix method, to infer the posterior probability distributions of cosmological parameters. We use these forecasted H(z) and DA(z) data to establish likelihood functions for SKA1 and SKA2. Here we note that, in the cosmological fit, (i) we only consider the BAO measurements, but not consider the RSD measurements; and (ii) for the BAO measurements the assumption of no correlation between H(z) and D\_A(z) is made. ……”

We have revised the manuscript according to the referees’ comments. We have tried out best to revise the manuscript. Comments from Referee 2 have been totally adopted. After revision, the quality of this paper has been significantly improved. We wish that our revision could make the referees satisfactory, and we expect that the paper can be recommended for publication.