

Peer Review

Review of: "Probabilistic Galaxy Field Generation with Diffusion Models"

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This paper develops an innovative approach to generate galaxy fields from large-scale dark matter fields. The comparison between the method proposed in this work and HOD/CNN is impressive. I have a few comments about this draft, which I believe would improve the clarity of this work.

1. The abstract seems to include too much introductory information while not enough results from this work. Try to add more concrete results, like some numbers listed in Table 1.
2. In the introduction section, it is necessary to give a brief review of previous works in this field. For example, some works from Francisci Villaescusa-Navarro. The authors need to highlight the advantage of this work compared to previous studies.
3. A more detailed description of the CNN and VDM architecture needs to be provided.
4. The cross-power spectra in Fig. 3 are a little confusing. The residuals should be plotted as well (like the left panel in Fig. 3). Does the higher level of VDM indicate “overfitting”? It is very surprising to me that CNN performs worse than the HOD. Can the authors provide some more explanation for this?

Declarations

Potential competing interests: No potential competing interests to declare.