Comment on egusphere-2022-231
Anonymous Referee #2

The paper presents a reasonable method for analyzing mesoscale eddies. It is based on an observed correlation between the enstrophy and kinetic energy and assumes that eddies have a Gaussian profile. The paper presents application of these ideas to global AVISO data. I am generally favorable of the work but have a few comments and questions that I hope the authors can address.

- In the abstract, please consider replacing "super vortex proxy" with "vortex proxy." As you mention in the text, the word "super" may be an overstatement.
- In Fig. 1, it is unclear from the caption if the quantity being visualized in (b) is $|v_g-v'_g|^2$ or $|v_g|^2-|v'_g|^2$. Please be more explicit.
- On line 74, you compare the results to the dataset of Faghmous (2015). Is there a reason? Have you considered also using Chelton et al dataset? Can you please comment in the paper? Would doing so constitute too much additional work?
- In eqs. 1,2,3,4, do you use absolute or anomalous values? I suspect you are using SLA, but it is confusing when you use $v'_g$ to represent anomalies in Fig. 1 and $v_g$ (sometimes v, without subscript) to represent the same thing in the text and equations.
- In eq. 5, you essentially define $R_{eff}$ as the ratio of the EKE to $Z$. But in eq. 2, $R$ is a parameter representing the radius of the eddy. Can you please comment on the relation between $R_{eff}$ and $R$?
- Line 122, the word "inevitable" is perhaps better replaced with another word? I could not understand the sentence.