Review comments

This study analyzed the data from ship-based ADCP and TSG data using second order structural functions to understand the dynamics of the currents in the Southwest Pacific Ocean. A Helmholtz decomposition was used to decompose the rotational and divergent components. One of the main points was to explore the possible regimes for the submesoscale range. It is a very interesting study and I am suggesting minor revisions for this study, and my suggestions to change are listed below.

Itemed suggestions

1. The instruction is a little bit lengthy, but missed some very relative publications (e.g., Torres et al., 2018 (JGR-Oceans); Cao et al., 2019 (JGR-Oceans); Pearson et al., 2019 (JGR-Oceans)). The key point of this study is to examine the role of rotational and divergent motions using the spectral analysis method. It is not necessary to talk too many details about the study for other sea regions, since they used the similar research method.

2. Around Line 25. It is not appropriate to say “IG waves include internal tides”. Though the IG waves have a frequency range that includes the tidal frequencies, they have different generating regimes. Besides, IG waves have their own dispersion relationship rather than at fixed tidal frequencies. Please modify this sentence.

3. Figure 4 shows that the confidence intervals are extremely large for the decomposed components. Are the results still reliable? We ever tried the decomposition in the structural functions and found out that sometimes one of the components could fall into negative values because the other components dominated. That could be the problem. It is necessary to discuss the problem of the method and the results could partly be trusted (maybe the dominated component).

4. It is interesting that no substantial seasonal variation is noticed. Usually, the seasonality of submesoscale motions should be prominent. Please make some comments on this.

5. In the text, sometimes you use figure 7 and sometimes Fig. 7.