

## Reply to Anonymous Referee #2

Comments:

1. from the moored buoys, we can obtain the profile data even though the depth is 23 m, it is possible to keep more instruments to obtain the data. if so, why authors do not use the different depths data to explain the mechanism?

### Reply:

There are various types of ocean buoy. The data buoy we used in this study is for meteo-oceanographic elements measurements, such as wind, wave and temperature. It is like US NOAA/NDBC's buoy (<https://www.ndbc.noaa.gov/>) or commercial buoys like Fugro SEAWATCH buoy (<https://www.fugro.com/about-fugro/our-expertise/technology/seawatch-metocean-buoys-and-sensors>). This type buoy has very loose mooring line to maintain a good wave following capability. Therefore the sea temperature sensor is normally mounted at buoy. Only sea surface temperature (~1.5m) is obtained. It is not like TAO buoys which measure the temperature profile. Only near sea surface temperature is measured and analyzed.

2. authors used current data but did not mention in which depths the data has been used.

### Reply:

We've added this information in the Section of 2.2.3 current data. The current profile data measured by ADCPs are from water depth -4 to -23 m (Note: current profile data only from ADCPs, not from buoys). The current profile data are used in Section 5.2 and Figure 7 to demonstrate that typhoons pump cold water from the subsurface of Longdong to cool the surface.

3. authors mentioned that the relation between SST drop and intensity of the typhoon, however, they did not give any relation between them.

### Reply:

In section 5.1, we discussed about typhoon dependence with the respect of coastal SST drop, we learned qualitatively the coastal SST drop is not related to typhoon central air pressure and typhoon central wind speed as well as typhoon moving speed, but typhoon track. Actually we also did the quantitative regression with typhoon

parameters and have shown the coefficients of determination in the original submitted manuscript. In the revised manuscript, we show the figures. Please see Figure 5(a)(b) and Figure 7.

4. from the figure 8, authors mentioned that Kuroshio waters intruded to Longdong and other observation areas, however at Longdong buoy area, the depth is only 23 m, how the Kuroshio waters come to the surface of the long dong buoy surface?

**Reply:**

This study suggested the Kuroshio subsurface cold waters intruded to Longdong (locates at 0.6 m depth and 0.6 km to coastline) according to the measured data and the analysis results. But how the propagation of the cold water is not in the scope of this research. Zhou et al. (2018) and Yang et al. (2018) (both have mentioned and listed in the manuscript's reference) suggested the topographic beta spiral may provide a dynamic channel for subsurface Kuroshio cold water intrusion to the continental shelf. For detail, it may needs a numerical model to carry out. The purpose of this study is to present the valuable and precious data from the field measurements. The data presented in this study can provide for model calibration or verification to have better and correct understandings on the mechanisms.

We have revised the manuscript and marked the revisions by blue color.