Review of "The shallow meridional overturning circulation of the South China Sea"

by N. Zhang, J. Lan, and F. Cui

Overview: This paper investigates the Shallow Meridional Overturning Circulation (SMOC) in South China Sea (SCS). The SMOC in SCS might have potential importance on regional climate because it transport heat from Southern to northern SCS. The SMOC has been investigated by Wang et al. (2004) with a simplified GFDL GCM, and Wang et al. (2004) suggested that the water exchange through Luzon Strait plays an important role on the formation of SMOC. By using oceanic reanalysis data (SODA), this paper investigated the mass balance of the SMOC, but with a very confusing presentation. If I understand correctly, this paper suggests that the SCS monsoon drives the SMOC through its dynamic and thermal dynamic effect. It does require large amount of work to improve this paper to be published.

Major comments:
1. The introduction does not state clearly the state-of-the-art of the present study. What is new, and why the study of SMOC in SCS is important? And several paragraph in the main content of this paper should appear in the introduction (last paragraph in section 3, fist paragraph in section 4.1, some sentence in the first paragraph of section 4.3…).
2. "Although some investigations have been carried out … little work has been done on the study of its dynamics (in the introduction)". That is not true. Wang et al. (2004) has investigated the dynamics of SMOC in their paper.
3. "The OFES data are used here for validation, …". I do not think we can say OFES data is the truth because it has high resolution. If you take OFES as the truth, you should use OFES data to investigate the SMOC not SODA data. I suggest the author either use the OFES data or only use the oceanic reanalysis data SODA. It is also worthy to do the same calculation with other oceanic reanalysis data like ECCO or GECCO.
4. The discussion on the seasonal and annual budgets should be separated. It is very confusing.
5. The mass budget of the SMOC (the downwelling, subduction and upwelling) is not closed, what is the problem?
6. Section 5 should be removed.