Ocean Science
Discussions

Open Access

EGU

**[OSD]**

Interactive
comment

# *Interactive comment on* "Technical Note: Two types of absolute dynamic ocean topography" *by* Peter C. Chu

**C. K. Shum (Referee)**

ckshum@osu.edu

Received and published: 10 July 2018

I was one of the reviewers of a prior version of the manuscript. The paper discusses two different types of absolute dynamic ocean topography (DOT) models based on two different types of marine geoids depending on which DOT is used for reference. The first type of marine geoid assumes water is at rest, which is touted theoretical and not measurable, and the second type is the satellite determined geoid. Based on first principle of physical oceanography, the author derived a new elliptic equation with the corresponding numerical solutions, and verified that the two different types of DOT have large differences, e.g., the standard deviation of the DOT horizontal gradients is nearly twice larger in the second type of DOT than the first type. As a result, the author concluded more studies need to be done based on the finding which

indicated that "the satellite determined DOT does not conform with the basic physical oceanography principle of geostrophic currents". While this original study may be unconventional, but the hypothesis stated and the approach based on the first principle to reveal the differences of the two types of DOTs commonly used is novel, I recommend publications with minor revisions. See the attached annotation of the manuscript.

Please also note the supplement to this comment:
https://www.ocean-sci-discuss.net/os-2018-51/os-2018-51-RC2-supplement.pdf

———————————————————

Interactive comment on Ocean Sci. Discuss., https://doi.org/10.5194/os-2018-51, 2018.