

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2021-413

Anonymous Referee #1

Referee comment on "Assessment of the sea surface temperature diurnal cycle in CNRM-CM6-1 based on its 1D coupled configuration" by Aurore Voltaire et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-413-RC1>, 2022

This manuscript presents a newly coupled atmosphere-ocean single column model (AOSCM, CNRM-CM6-1D). It demonstrates the model's ability to simulate the diurnal cycle based on a case study during the Cindy-Dynamo campaign. The authors explore the dependence of skill in modeling the diurnal SST variability on coupling of the components and the coupling frequency. The manuscript is well written, coherent, and presents a relevant scientific contribution. It demonstrates the usability of the new AOSCM and points out several questions that can be investigated with it. I recommend acceptance upon a few minor edits. I list my comments below.

L17 "This suggests that.." This sentence is not clear, please explain.

L26/27 "either between parameterizations" -- "between parameterized processes" ? It might help the reader if you gave an example.

L47 suggest "as is the case in the the real.."

Section 3.3 and 3.4 (and or Table 1) should mention nominal vertical resolutions and active parameterization schemes (i.e. KPP or TKE or ... in the ocean? schemes in the atmosphere?), and nudging / restoration time scales

L237 and 238 suggest removing "clearly"

L296 suggest removing "It mean that"

Table 2 / experiment Vadv: is the 0.1degree C cooling throughout the column? Across a level? Across base of the mixed layer?

Fig 1 rotate epsilon in upward arrow

Fig 5 Why are the profiles shown in reference to ERA-Interim, and not as they are next to each other? Why not in reference to the R/V Revelle soundings that should be more accurate?

Fig 15c (and 16f lower part): is the significance correctly indicated here?