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Geoscientific Model Development Discussions
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Interactive comment on "Taiwan Earth System Model Version 1: Description and Evaluation of Mean State" *by* Wei-Liang Lee et al.

Anonymous Referee #1

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This is a description paper of the new Taiwan Earth System Model (TaiESM) Version 1, which is developed based on CESM1.2.2. Updated physics from CESM are described and the basic features in mean climates of TaiESM are shown. Model biases are also compared with CMIP5 models. As such, this paper should appear in GMD. Some minor addition and corrections would improve the quality of the paper.

(1) Although the paper only deals with mean state, information of simulated ENSO would be desirable because ENSO is the largest important of tropical variability of the atmosphere-ocean system. This has been included in most of description papers.

(2) line 118-120: Mention that large bias still exists compared to TRMM3B42. TRMM shows 20-22 LT peak, while model shows 16-18 LT peak over Africa, India and Indochina peninsula.

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Discussion paper

(3) Line 135: What is “solesoid”? Solenoid?

(4) Line 221: Where is the model top. Add “model top at x.xx hPa”

(5) Line 279, Table 1: Add estimated observed values.

(6) Line 327-333: Figure 6 shows that there are positive bias near the coast and negative bias off the coast in low cloud fraction. Is there any explanation for this?

(7) Line 413-415: This point should be described in Section 2 Model description. Similarly, is river runoff treated as input in the ocean model?

(8) Line 418-434: Also mention whether TaiESM is better the CESM or comparable or other.

(9) Line 331: Figure 6b should be Figure 6c.

(10) Line 333: Figure 6c should be Figure 6b.

(11) There are two Wang et al. (2015). Distinguish the two in the main text and references.

(12) Some references use “and co-authors”, while others write down all authors. Follow the journal requirement.

(13) A long list of incomplete referencing. Followings are in the main text, but not in the reference list. IPCC 5th Assessment Report 2013 Wang et al. 2018 > 2019? Shiu et al. 2018 Pan and Wu 1995 Han and Pan 2011 Tu et al. 2005: may be Tu and Tsuang 2005 Park and Bretherton 2009 Bretherton and Park 2009 Morrison and Gettelmen 2008 Zhang and McFarlane 1999 > 1995? Shamrock et al. 2008 > 2005? Gu et al. 2012 Liou et al. 2013 Hunke and Lipscomb 2008 Smith et al. 2010 Kay and Gettelman 2009 Gent et al. 2011 Following is in the reference list, but not in the main text. Guichard et al. 2004

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