General Comments:

Transoceanic tsunamis may cause serious damages to the highly populated coastal areas, such that early warnings based on the forecast of tsunami considering its coastal impact are very important. Using multi-grid nesting, this paper presents a very promising numerical tool which could simultaneously simulate the evolution of tsunami at the oceanic basin-scale with a coarse grid and the coastal inundation in the nearshore-scale with a finer grid. The four different tests demonstrate this capability impressively. The paper is well-written, and the organization of content is great. However, if the author could present more information about the background of FUNWAVE-TVD, more details about the grid/memory management, and more results about model accuracy/efficiency will improve readers' understanding about the equal workload, multigrid nesting interface. My suggestions are given as below.

Specific Comments:

1. Introduction (section 1) is not well-organized or lack of some information. Part of this is explained in "Technical Corrections". My suggestion is to re-organize the content following this manner: a) governing equations and explain why choose the dispersive ones. I have the same feeling as the other reviewer that the author needs to explain the need of finer grid and the relation to dispersion property more clearly; b) techniques for multi-scale tsunami modeling, including AMR and nested grids. First, introduce the AMR and why it is not ok for your governing equations; c) Second, introduce nested grids with figure 1; d) for nested grids, why two-way nesting is necessary or useful; e) summarize what has been done/ innovations (interpolator/restriction operator, data management, etc…) of this work.

2. Section 2 (FUNWAVE-TVD). First, it could be better to move lines 150-160 here and add a subsection just for the development relating to FUNWAVE. Second, use one paragraph in section 2.1 (no need to separate the content). Third, section 2.2 is over-simplified. Even though this part is not that important in this paper, enough information about the numerical schemes used by FUNWAVE-TVD is necessary. What's more, one thing should be explained is that the core program FUNWAVE-TVD only needs a grid (parent or child), an initial condition, and the boundary conditions in ghost cells to launch. This is necessary as a precondition for the multi-grid nesting interface. Last, use a figure similar to figure 3 to explain the penalization and ghost cells in section 2.3.

3. Algorithms in section 3 are not introduced clearly. First, the restriction operator should be important, but I do not know what it is. Please provide an equation. Workload balance is easy in section 3.3, but what I am interested in is the data management. Could please provide more details regarding the shared memory and grid management? Last, figure 4 could be improved with condition judgement, details of grid/variables/boundary assignment.

4. Section 4, Applications. I understand that the authors mentioned the units for figures. But it could be more straightforward to include this information along with the figure colorbar. In addition, I know that the present model has been verified with laboratory data. But it could be great to add a fine-grid simulation in section 4.1with a single grid resolution of 1.25m and do the comparison. This way, it is clearer to demonstrate the effectiveness of the present work. Last, improve the axis labels of figures 15 and 16.

5. I'm personally interested in one question that, is the code suitable for grid refinement for two separated areas?

Technical Corrections:

No.	Location	Comments
1	Line 5-10	Address format is not consistent
2	Line 14	Cite the paper for FUNWAVE-TVD as there exists several versions.
3	Line 16	The nesting interface has more functions, like grid/memory management.
4	Line 17	"child grids"
5	Line 19	Remove comma in "data management, "
6	Line 21	"to verify the nesting algorithm, to assess model accuracy…"
7	Line 22	"modeling" to "model"
8	Line 35	Remove "and accuracy". Strategies in workload balance, data management, and parent-child communications does not guarantee accuracy.
9	Line 31-36	I cannot find the advantage of the new interface here. At least, it should not be a repeat of the Abstract.
10	Line 45	"are typically based on"
11	Line 47	Remove "or" with ","
12	Line 48	", or on"
13	Line 40-64	This part has explained why using dispersive models. But, why do not choose the non-hydrostatic models?
14	Line 79	"coarse grid to the fine grid", opposite?
15	Line 65-82	The reason for two-way nesting is not clear. What if the feedback from fine grid to coarse grid is small? Provide some references. Somehow, this has been explained in lines 101-120.
16	Line 150-167	The prime work should be summarized here, not the objective.
17	Line 171	"the present study"
18	Line 186-187	"Governing equations" is good enough.
19	Between line 189 & 190	Explain the dimensionless parameter mu.
20	Line 191	"equation (4)". Check the whole paper, please.
21	Line 232	"two-way"
22	Line 230-233	Not necessary.
23	Line 246	operators
24	Line 247-256	This can be explained in the end of Introduction, along with interpolator and restriction operators.
25	Equation (10)	Use symbols other than t and s as they are used for time and grid refinement ratio.
26	Line 313	"a time step"
27	Line 315	"program is called"
28	Figure 4	Explain the flowchart where a condition (two directions) is checked.

29	Equation above line 331	Please add dimension.
30	Figure 6	Four different lines are plotted but I can only distinguish part of them. Figure 6 is used to show that the evolution of elevation at four locations are almost the same, but this can be explained in the text without an extra figure. Or, if the accuracy is important, why not adding information about the relative difference?
31	Figure 10	Some figures use (a), but this figure uses (1)-(8)
32	Line 393-394	If the test 4.2 is not a typical case for demonstrating the efficiency of the nested grid method, could you give us a good demonstration as the I regard the computational efficiency is very important. Also, it will be a great promotion of this work.
33	Line 512-513	Not necessary.
34	Line 533	Please check the full references. Geophysical Research: Oceans, 122(12)
35	Line 538	Geophysical Research Letters, 41
36	Line 541	"Tech. rep.", abbreviation?
37	Line 544	Hawaii
38	Line 568	49
39	Line 637	Fuhrman, D. R. (space)
40	Line 657	Space after doi:
41	Line 660	43
42	Line 661-663	Style is not consistent with Kirby et al. (1998)
43	Line 670-672	Style is wrong
44	Line 674	doi: (lower case and space)
45	Line 684-685	could be a research report