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## ***Interactive comment on “ASAMgpu V1.0 – a moist fully compressible atmospheric model using graphics processing units (GPUs)” by S. Horn***

**Anonymous Referee #1**

Received and published: 16 October 2011

Dear Authors/Editors,

I believe the paper should be accepted based on its merit. The paper presents an analysis of GPU performance on cloud models. The minor revisions I would suggest are on grammar and one additional figure or table. A figure or table should be added that shows the relationship between precision/resolution gained, number of GPUs used, time of execution, and power consumed. I think this figure is critical because the conclusion states precisely "This new architecture enables high resolution atmospheric modeling on small client devices at relative low power consumption" without any reference to what resolution was actually achieved with the simulation. The resolution/precision could be determined by doing a convergence analysis over different sized grids.

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The majority of my comments are on the use of language that includes relative comparisons (like low-cost, enormous amount, massive amount, wide bandwidth, most efficient). Ideally a publication should last for a long time. A relative comparison now will become irrelevant in a year. I believe this damages the credibility of the paper. It is far easier to say in exact terms what is being compared and the quantity of difference between the two things being compared. Otherwise the statement is inconclusive at best or downright incorrect at worst.

1. Page 2636, Line 4: "OpenGL and GLSL is used" should be "OpenGL and GLSL are used"
2. Page 2636, Line 10: "saturated environment, and"
3. Page 2636, Line 17: consider deleting "On the other hand"
4. Page 2636, Line 22-23: "enormous amount", "low power", and "low cost" are relative values and should be replaced by a specific comparison so that the paper remains relevant to later generations
5. Page 2636, Line 25: "three-step"
6. Page 2637, Line 3: "second chapter" is incorrect
7. Page 2637, Line 6: "ice-phase"
9. Page 2637, Line 19: "low-cost" is relative and should be stated precisely or not included
10. Page 2637, Line 25: "non-graphic"
11. Page 2638, Line 5: "is a bit different" should probably be "is different"
12. Page 2638, Line 5: "The computation process is defined using a certain number of buffers, also called textures."
13. Page 2638, Line 8-9: Should be "kernels or shaders" or otherwise match plurality
14. Page 2638, Line 10: split sentence. "GLSL supports functions, if-branches, and loops. The choice of these functions significantly affect the performance of the resultant code as if-branches can take XXX % longer to execute than other floating-point operations."
- 15: Page 2638, Line 14: "a number of output texture framebuffers" should say how many output texture framebuffers to be more precise.
- 16: Page 2638, Line 20: revise sentence so that it makes sense.
- 17: Page 2638, Line 25: This sentence uses relative, qualitative comparisons (massive amount, wide bandwidth, most efficient). Those comparisons should be more precise.
- 18: Page 2652, Line 6: remove "new" it is unnecessary as in a year it will be "old"
- 19: Page 2652, Line 17: "ice-phase"

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Also indent the equations.

I would revise Fig 5 to add a figure tab showing the dimensions of a single cloud cell.

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Interactive comment on Geosci. Model Dev. Discuss., 4, 2635, 2011.

**GMDD**

4, C879–C881, 2011

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