

---

Subject: Re: Question about volume objects and opacity  
Posted by [Karl Schultz](#) on Fri, 30 Sep 2005 21:20:33 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

On Fri, 30 Sep 2005 19:31:29 +0200, Klemens Barfus wrote:

> Dear list members,  
>  
> trying to visualize three dimensional cloud fields, I started to work  
> with object graphics. I created a testcase to get the differences  
> between volume objects and polygon objects to decide which object to use.  
>  
> What I do not understand is the attribute opacity of the volume objects.  
> In the code below opacity is 255 and therefor all the volumes should be  
> opac and have the same colour. The polygon graphic should look like the  
> volume graphic, or not ?  
> But in the areas where there are more voxels in direction of the view,  
> colour is a little bit more solid then in the areas where there is just  
> one filled voxel.  
>  
> Is there something wrong in my understanding of volume objects ?  
>  
> Thanks for your help in advance !  
>  
> Klemens

I think your understanding is correct. The volume renderer implementation takes some shortcuts in the name of efficiency. It uses integer math when it can. It also pre-multiplies the color table by the opacity table. Keeping integer math in mind, you can see that  $0xff * 0xff = 0xfe01$ , and if you normalize that back to 8 bits, you get  $0xfe$ . So your effective color for 100% red is really  $[254, 0, 0]$ . That's not the entire story, but you get the idea. I suppose that you can argue that it is a bug, but it may also be a planned shortcoming as a trade-off for speed.

I also point out that I really could not \*visually\* see the problem your program demonstrates. I had to read the pixels back from the window and examine them to see that the reds ranged from 247-255. Maybe I could see the difference between a block of pixels with color  $[247, 0, 0]$  and a block of  $[255, 0, 0]$  if they were right up next to each other, but I wouldn't be able to detect this difference in any other situation. I don't know if the difference is significant for you or not.

That's the explanation.

Karl

---