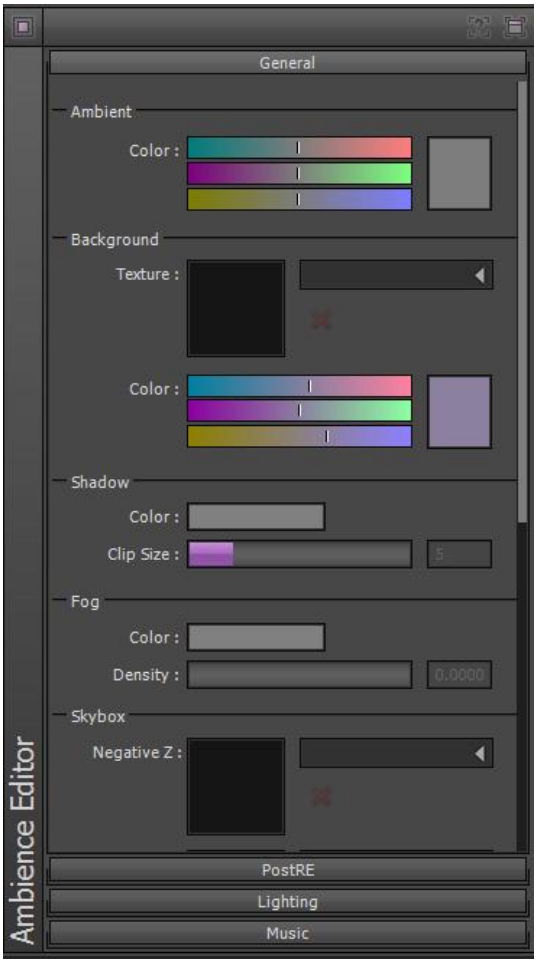
Chapter

11

# Pure Ambience

In this Chapter I'm going to be showing you how to use the Ambience Editor. The Ambience Editor module manages the visual parameters of Scenes such as colour and dynamic shadows, intensity, precomputed static lighting, bloom effect, fog, colour saturation, ambient music, etc. Note that this module is only available when a Scene is opened in the Scene Viewer.

Basically, the Ambience Editor allows you to define the Scene background, configure bloom, fog & shadows and compute lightmaps etc.

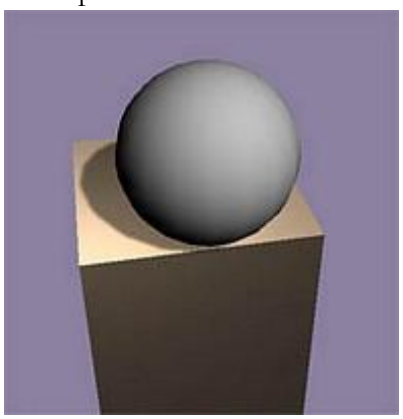


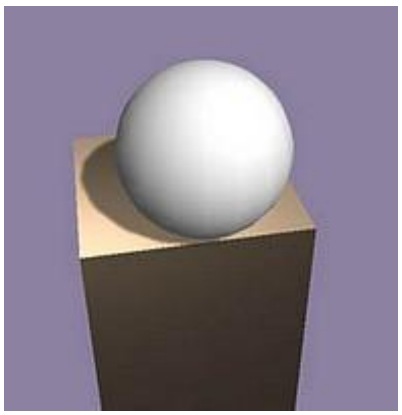
**Ambient:**

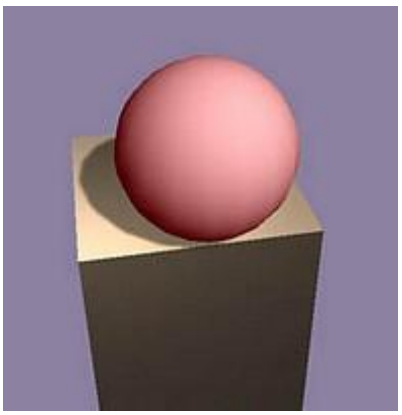
These options allow the setting of the Ambient colour. This colour is calculated as follows:

Ambient colour = ambient shader * ambient scene

Examples:


Black ambient scene

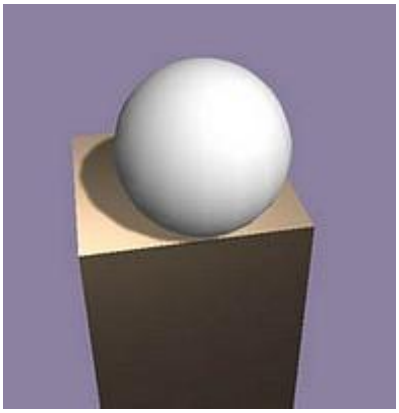

White ambient scene


Red ambient scene

**Background:**

These options allow the setting of the background colour. It is possible to use a Texture for this if required. However, if the Texture contains an alpha channel, then the background colour will be used instead.

Examples:


Default background


Green background

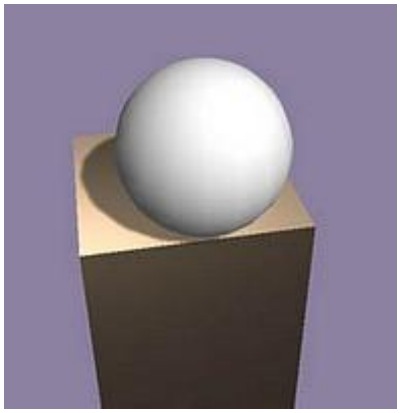

Textured with a 32-bit TGA with alpha

**Shadow:**

These options allow the setting of the shadow colour and intensity.

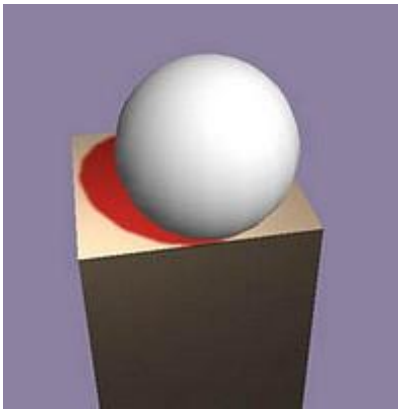
**Clip Size**: This option allows the setting of the clipping distance of the shadows. i.e.: the minimum size in percent of the bounding Sphere of the Object on the screen [0 to 25].

Examples:



Shadow colour: medium gray

Shadow colour: light gray



Shadow colour: red

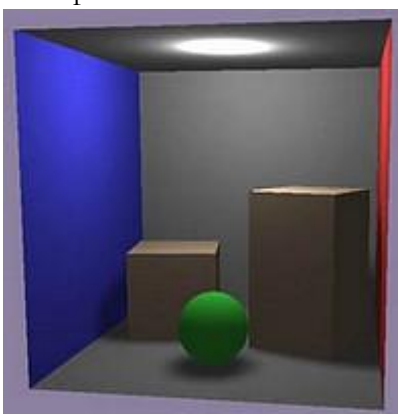
**Fog:**

These options allow the setting of the fog colour, density and height. This only affects those Materials that have been configured to receive fog. i.e.: **receive fog** has been selected in the Material Editor.

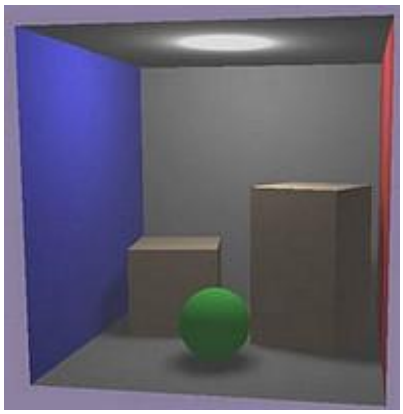
**Density**: This option allows the setting of the density of the fog [0 to 1].

**Height fog**: This option, if the check box is checked, allows the setting of the height from which the fog will start [-9999 to 9999].

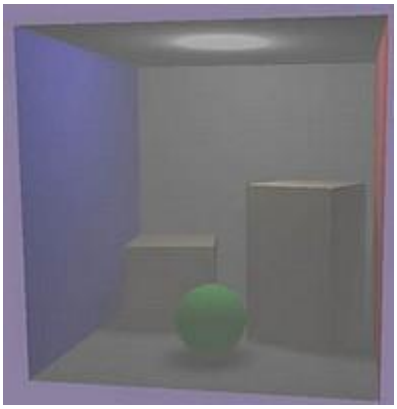
Examples:



fog density: 0



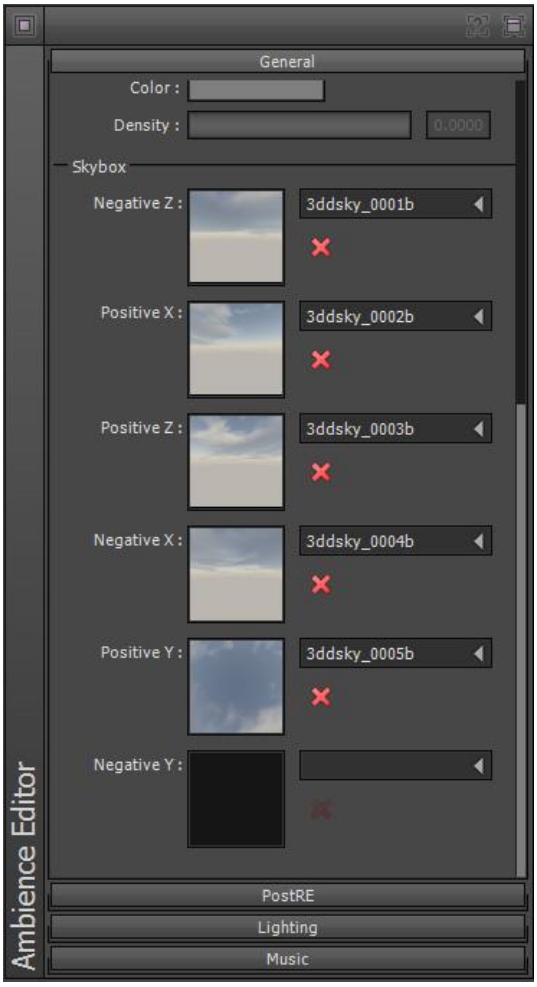
fog density: 0.18



fog density: 0.28

**Skybox:**

This option allows the creation of a skybox from 6 Textures.




The skybox dialog allows the setting up of a Skybox in ShiVa, which can consist of up to 6 Textures, one for each face of the Skybox:

**Negative Z**: This option allows the addition of a Texture for the part of the Skybox that is normally to the rear of the Camera

**Positive X**: This option allows addition of a Texture for the part of the Skybox that is normally to the right of the Camera.

**Positive Z**: This option allows addition of a Texture for the part of the Skybox that is normally in front of the Camera.

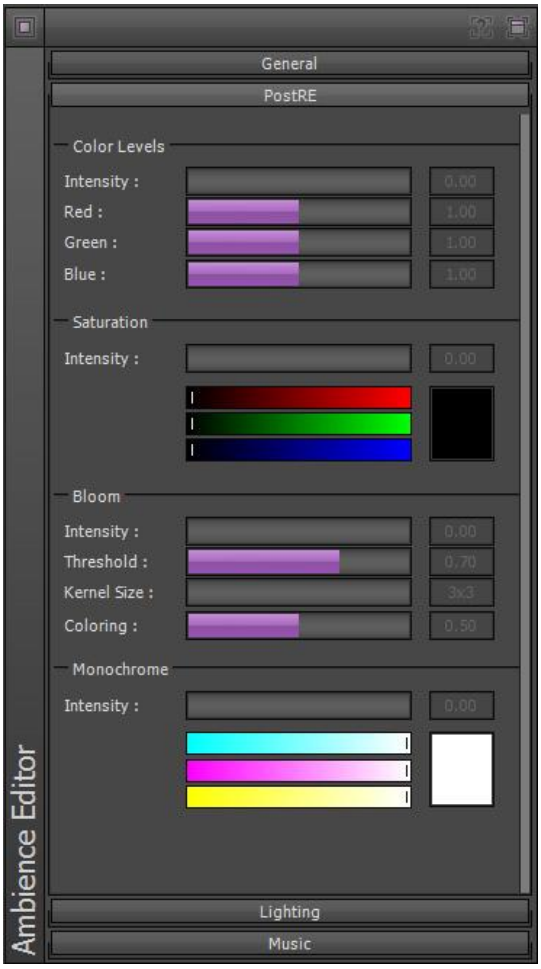
**Negative X**: This option allows addition of a Texture for the part of the Skybox that is normally to the left of the Camera.

**Positive Y**: This option allows addition of a Texture for the part of the Skybox that is normally above the Camera.

**Negative Y**: This option allows you addition of a Texture for the part of the Skybox that is normally left empty because it is below the Camera and, as such, usually beneath the Scene.

**NOTE**: empty slots will be filled by the background colour or Texture.

## PostRE (Post Render Effects)




The PostRE Dialog allows the setting of effects that will be applied after the rendering process has been completed.

**Color Levels**:

These options allow the setting of the colour level by setting the 'Red', 'Green', 'Blue' and 'Intensity' level sliders. This will apply the selected colour filter on all images. It is also possible to 'boost' the colour level by a factor of 2.

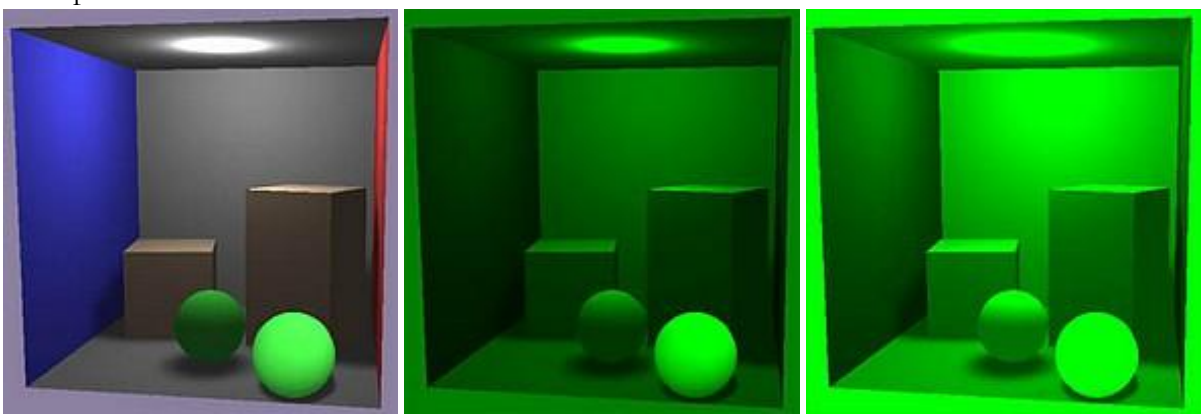
**Intensity**: This slider allows the setting of the size of the effect [0 to 1].

**Red**: This slider allows the setting of the amount of red in the colour [0 to 2].

**Green**: This slider allows the setting of the amount of green in the colour [0 to 2].

**Blue**: This slider allows the setting of the amount of blue in the colour [0 to 2].

Examples:



color level 0 color level 1 color level 2

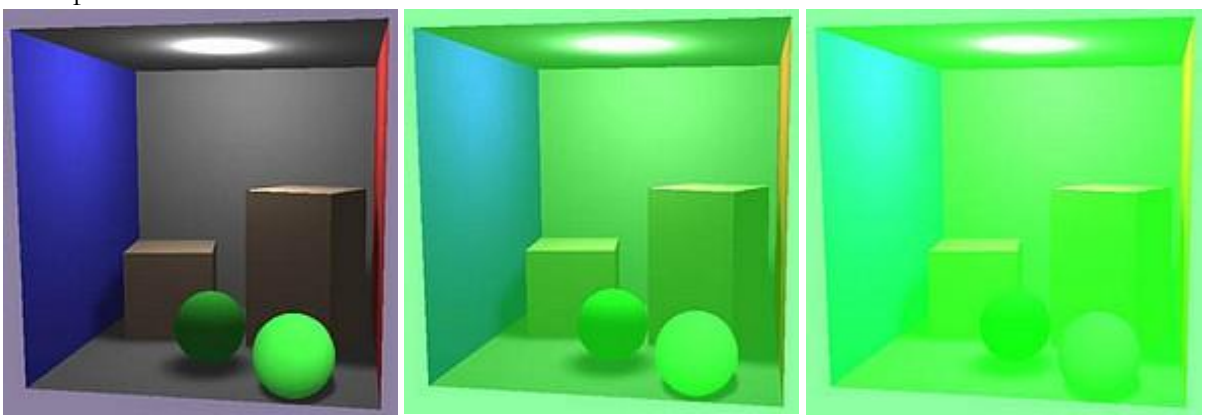
**Saturation:**

These options allow the setting of the saturation level by setting the red, green, blue and 'Intensity' level sliders. This will apply the selected saturation with the selected colour.

*Intensity*: This option allows the setting of the size of the effect [0 to 1].

**NOTE**: moving the red, green and blue sliders will change the colour in the box next to them, thus setting the colour for the effect.

Examples:



saturation to 0 saturation to 0.5 saturation to 1

**Bloom:**

These options allow the setting of the bloom (i.e.: glow) by setting the 'Intensity', 'Threshold', 'Kernel Size' and 'Coloring' levels. This will create a glow effect around Light sources or bright surfaces:

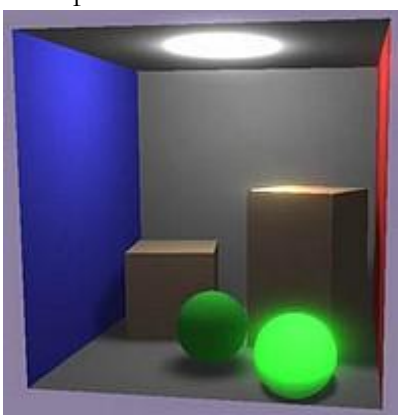
**Intensity**: This option allows the setting of the size of the effect [0 to 1].

**Threshold**: This option allows the setting of the threshold above which the effect will be applied [0 to 1].

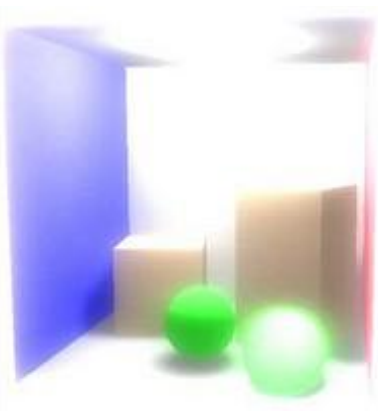
**Kernel Size**: This option allows the setting of the precision of the effect [3x3, 5x5 or 7x7].
**NOTE**: the cost of this effect is proportional to the chosen size.

**Coloring**: This option allows the setting of the colour bleeding applicable to the effect [0 to 1].

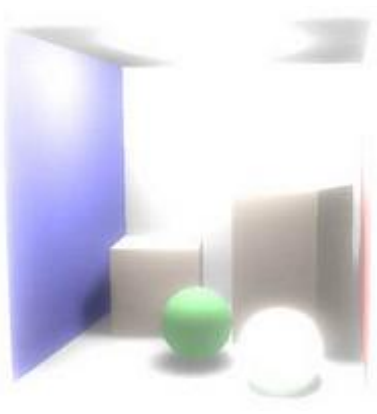
Examples:



Intensity: 2 | Threshold: 0.7 | Coloring: 0.5



Intensity: 2 | Threshold: 0.1 | Coloring: 1



Intensity: 2 | Threshold: 0.1 | Coloring: 0

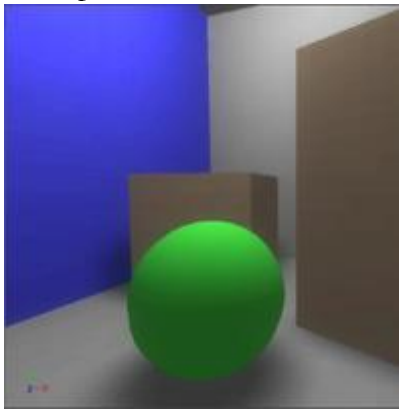
**Monochrome**:

These options allow the setting of the monochrome levels by setting the blue, pink, yellow and 'Intensity' level sliders. This will display the scene in shades of the selected colour, thus making it possible to obtain effects such as Sepia or Grayscale.

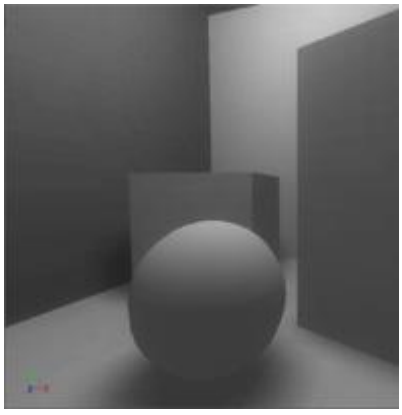
**Intensity**: This option allows the setting of the size of the effect [0 to 1].

The blue, pink and yellow sliders will change the colour in the box next to them, thus setting the colour of the effect.

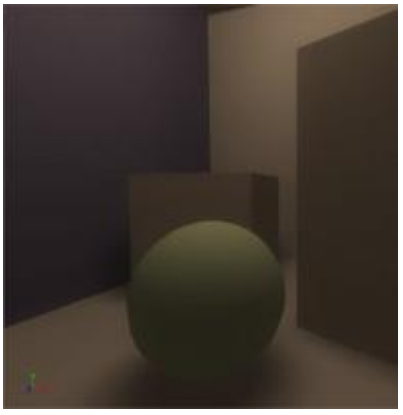
Examples:



intensity: 0

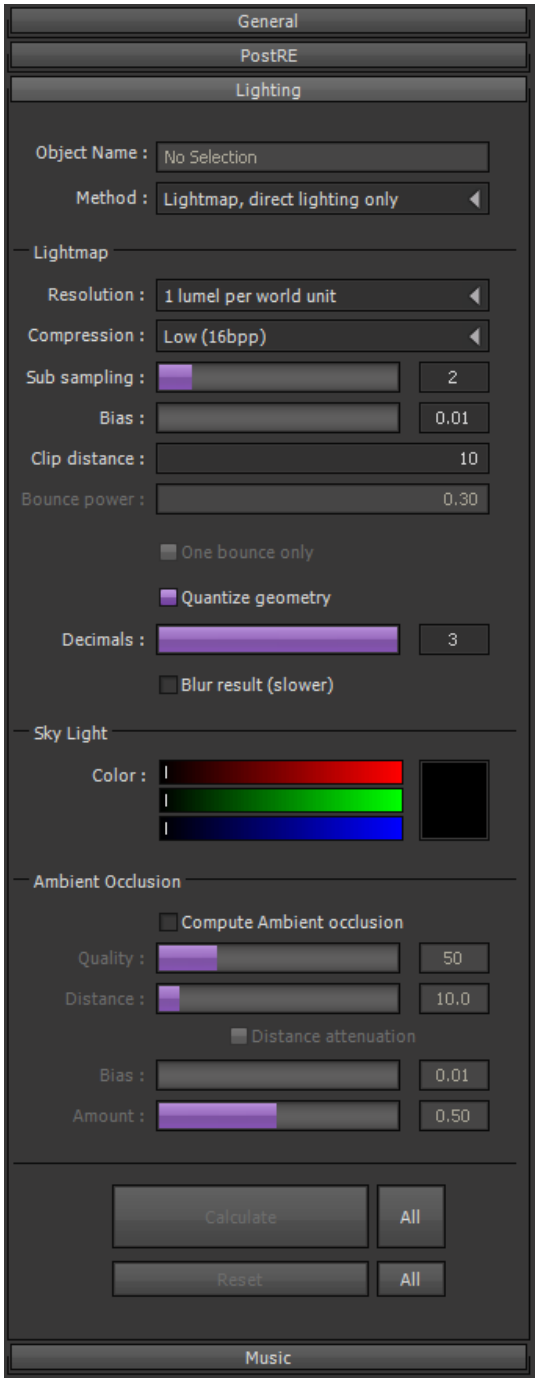


R: 255, G: 255, B: 255
intensity: 1



R: 162, G: 138, B: 101
intensity: 0.90

## Lighting




The lighting dialog allows the setting of all Parameters required by ShiVa to calculate **static lighting**. There are two methods to achieve static lighting, available in the 'method' drop-down:

**VertexColor**: This option modulates the lighting colour with the colours of each vertex of a Mesh.

**Lightmap**: This option generates a Texture containing the lighting.

To determine which one is the best method, it is important to consider the types of Meshes involved. ie: if you have detailed meshes then the *Vertex Color* method would be preferable, otherwise use the *Lightmap* method.

**NOTE**: You can find the size of any generated LightMaps of the Object in the **Shape Attributes** panel of the Attributes Editor, and the total number of LightMaps in the **Scene > Infos** dialog of the Scene Viewer.

### Lightmap

*Resolution*: This option allows the setting of the resolution of the LightMap, in lumels per world unit, from one of the following:

1 lumel every 32 world units – lowest resolution, smallest size
1 lumel every 16 world units
1 lumel every 8 world units
1 lumel every 4 world units
1 lumel every 2 world units
1 lumel per world unit
2 lumels per world unit
4 lumels per world unit
8 lumels per world unit
16 lumels per world unit
32 lumels per world unit – highest resolution, biggest size

This defines the number of pixels that will be allotted to the LightMap grid.
**NOTE**: if the resolution is too small, the result will be all white or all black.

C*ompression*: This option allows the setting of the compression of the final Texture [24bpp (None) or 16bpp (Low)].
**NOTE**: selecting 16bpp will reduce the quality of the Texture.

*Sub sampling*: This option allows the setting of the sub-sampling level [1 to 8]. This will be the number of iterations used by the lighting calculation.

*Clip distance*: This option allows the setting of the distance from which Objects will be taken into account by the lighting calculation.

*Bounce power*: This option allows the setting of the bounce power of the cast Ray, and is used for pre-computed GLOBAL illumination calculations (**NOTE**: this functionality is not yet available).

*One bounce only*: This option allows the setting of the bounce of the cast Ray, so that only one bounce is performed. This is used to speed up the time taken by the calculations (**NOTE**: this functionality is not yet available).

*Quantize geometry*: This option, if checked, attempts to reduce any artifacts on a quasi-planar surface, by reducing their vertex positions to make them coplanar.

*Decimals*: This option allows the setting of the reduction used in "*Quantize Geometry*" [0 to 3].

*Blur result*: This option, if checked, sets that the resulting LightMap will be slightly blurred, which can help to reduce pixellation.

### Sky Light

This option allows the setting of the colour of the sky light by setting the red, green and blue sliders.

### Ambient Occlusion

Ambient Occlusion enhances the contrast and realism of the LightMap during its computation.

According to Wikipedia:

"Ambient Occlusion attempts to approximate the way light radiates in real life"

"It is most often calculated by casting rays in every direction from the surface. Rays which reach the background or "sky" increase the brightness of the surface, whereas a ray which hits another object contributes no illumination. As a result, points surrounded by a large amount of geometry are rendered dark, whereas points with little geometry on the visible hemisphere appear light."

To enable Ambient Occlusion in ShiVa, you will need to check the 'Compute Ambient occlusion' check box. This will then enable the following options:

*Quality*: This option allows the setting of the number of rays cast [1 to 200].

*Distance*: This option allows the setting of the distance at which Objects will be computed [1 to 100].

*Distance attenuation*: This option, if checked, sets distance attenuation to be used. Distance attenuation is the gradual loss of intensity over distance.

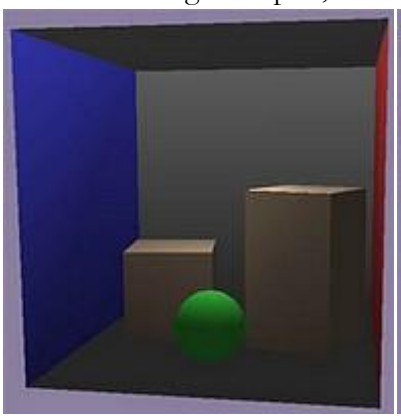
*Bias*: This option allows the setting of the offset from the Mesh at which the rays will be cast [0.001 to 0.1].

Amount: This option allows the setting of the amount of Ambient Occlusion [0.01 to 1].

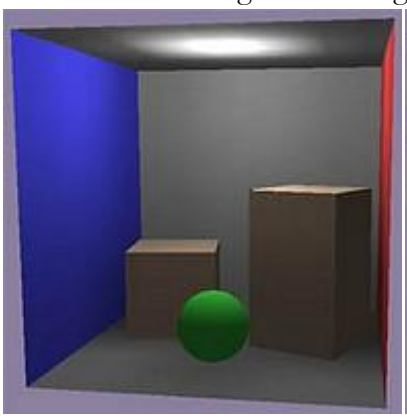
***Calculate***: This button allows calculates the LightMap based on the settings entered in the fields detailed above.
**NOTE**: The '*All*' button allows the calculatation of all LightMaps in the Scene.

***Reset***: This button resets the LightMap.
**NOTE**: the '*All*' button resets all LightMaps in the Scene.

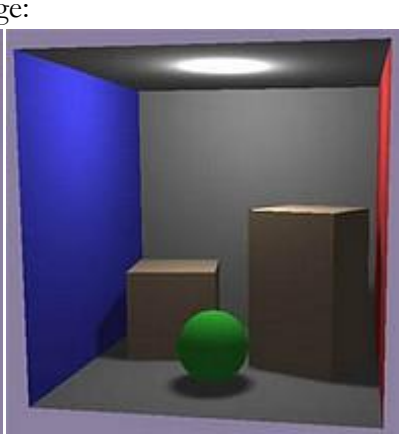
Examples:
In the following examples, the cube is 2 meters long on each edge:



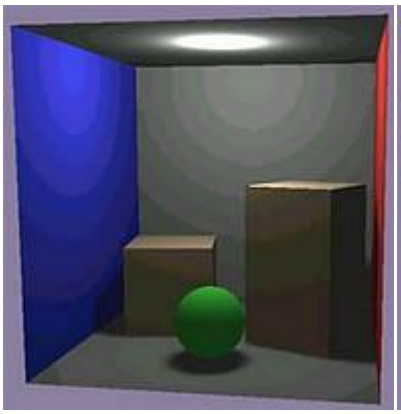
vertex colour



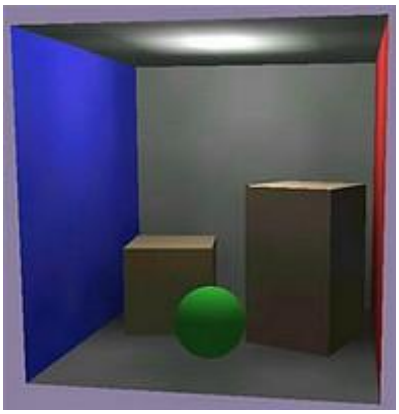
lightmap | 8 l/wu | compress: 24



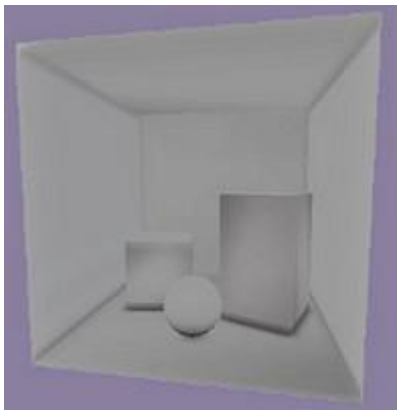
lightmap | 32 l/wu | compress: 24



lightmap | 24 l/wu | compress: 16

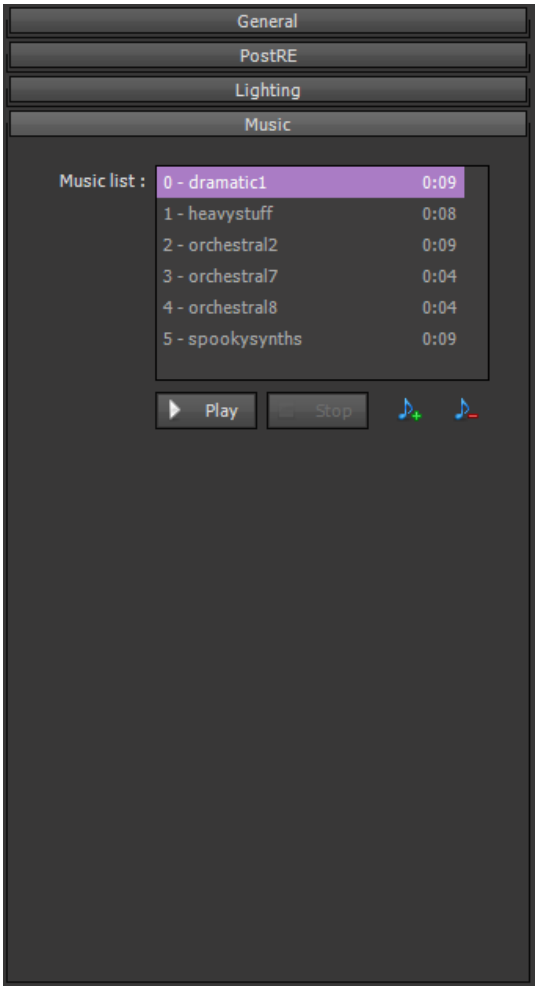


lightmap | 8 l/wu | compress: 16

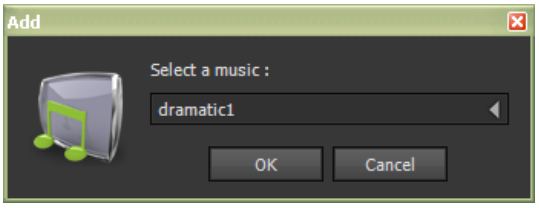


lightmap | 8 l/wu | Ambient Occlusion

## Music



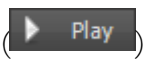
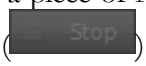

The music dialog allows the setting up of the Music to be used in the project. Music can be dragged'n'dropped from the Data Explorer into this list, or you can use the (  ) button to add music using the following dialog:



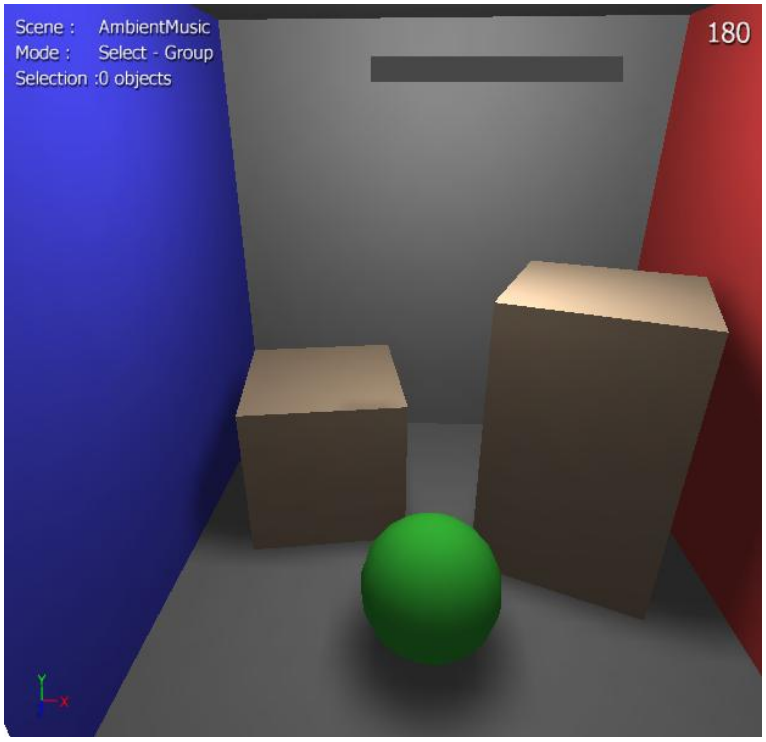

**NOTE**: any Music must already be imported into the project before it can be added to this list.

**NOTE**: the Music API can be used, via Script, to play Music simply by using the index number obtained from this list.

To remove a piece of Music from the list, simply select the piece of Music and click on the (  ) button.

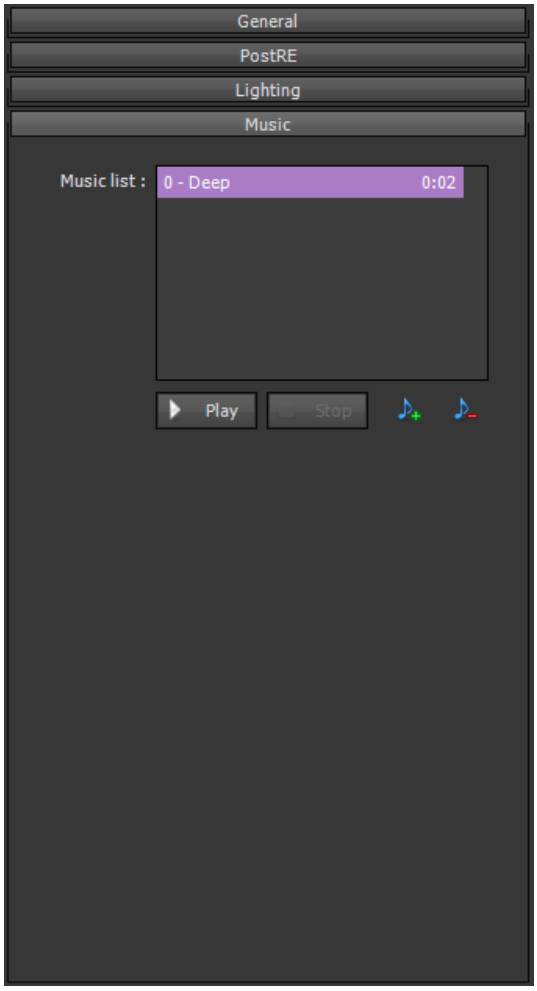
To listen to a piece of Music, select it and click on the (  ) button. To stop a piece of Music click on the (  ) button.

For this Chapter, I'll be showing you how to implement ambient music, using the "AmbientMusic" demo. This demo uses the same Scene as in previous demos. You know, the one with the two boxes, and the ball (though the ball is on the ground for this one!):




OK, so you have a Scene, what's next? Well, there are a few Scripts, but I'd better start with the Ambience Editor itself:

The only tab that we are interested in here is the **Music** tab (feel free to play around with the options in the other tabs to see what effect they have on the Scene), which looks like this:




As you can see, there is one piece of Music ("Deep") at index "0". Well, that's really it for the Ambience Editor itself (as far as this demo goes, anyway!).

However, to use this Music, we must write some Scripts, and this demo consists of one AIModel ("AmbientMusic_Main"), which consist of the following:

**Functions**

loadScene ( )
startMusic ( )

**Handlers**

onInit ( )

I'll start with the solitary Handler ("onInit ( )"):

**onInit ( )**

This Script has two lines, which call the two Functions:

```
this.loadScene ( )
this.startMusic ( )
```

**loadScene ( )**

Moving on, we come to the "loadScene" Function, which is only one line, which loads the "AmbientMusic" Scene:

```
application.setCurrentUserScene ( "AmbientMusic" )
```

**startMusic ( )**

Finally, we need the "startMusic" Function:

```
local s = application.getCurrentUserScene ( )

if ( s~= nil )
then
   music.play ( s, 0, 1 )
end
```

Firstly, we get a Handle to the current Scene for the current User ("s"). Then we check that it was created successfully and, if so, we tell the Music to start playing, using the following values:

| | | |
|---|---|---|
| s | - | the current Scene |
| 0 | - | the index of the Music to be played |
| 1 | - | the fade time of the Music (1 second) |

Another Chapter down! Only a couple more to go until we start the Dino Hunter game! Next up is a Chapter on Animation.