
Subject: [update]: artifacts with volume rendering
Posted by [s\[1\]](#) on Wed, 26 Feb 2003 13:24:15 GMT

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I wrote a little program that shows the artefacts. I create a volume, cut it of a cube, and render a short sequence. The artefacts are clearly recognizable on the cutting surfaces.

```
;; volume_artefact: show volume rendering artefacts on cutting
;; surfaces inside a volume
```

```
FUNCTION CREATE_SIMPLE_VOLUME
```

```
;; create a simple volume containing one big red object and two small
cubes
```

```
voldims = [180L,150L,130L]
```

```
voldims = [80L,75L,70L]
```

```
vol = OBJ_NEW('IDLgrVolume')
```

```
voldata = fltarr(voldims)
```

```
;; fill the volume with values: highest values along the z-axis,
```

```
;; values cylindrically decreasing with distance to the z-axis
```

```
r1 = voldims[0] / 2 & r2 = voldims[1] / 2
```

```
FOR i=0,(voldims[0]-1) DO FOR $
```

```
  j=0,(voldims[1]-1) DO voldata[i,j,*] = (i-r1)^2 + (j-r2)^2
```

```
voldata = 255 - BYTSCL(voldata)
```

```
;; cut the left top front cube out of the volume
```

```
volData[0:(voldims[0]/2.), (voldims[1]/2.):voldims[1]-1, (voldims[2]/2):voldims[2]-1]
= 0
```

```
;; highlight front bottom right and left bottom back cube a little bit
```

```
volData[(voldims[0]/2.+
```

```
5):(voldims[0]-1), 0:(voldims[1]/2.-1), (voldims[2]/2):voldims[2]-1] = 155
```

```
volData[0:(voldims[0]/2.), 0:(voldims[1]/2.-1), 0:(voldims[2]/2)-2] = 155
```

```
vol->SETPROPERTY, data0=volData, ZBUFFER=1, ZERO_OPACITY_SKIP=1, $
INTERPOLATE=1, OPACITY_TABLE0=(INDGEN(256) / 1)
```

```
;; center volume at 0,0,0 and fit it into a unit cube
```

```
cc_facs = voldims / float(max(voldims))
```

```
cc = fltarr(2,3)
```

```
cc[0,*] = -0.5 * cc_facs
```

```
cc[1,*] = 1.0 / voldims * cc_facs
```

```
vol->SETPROPERTY, XCOORD_CONV=cc[*,0], YCOORD_CONV=cc[*,1],
```

```
ZCOORD_CONV=cc[*,2]
```

```
RETURN, vol
```

```
END ;; of: CREATE_SIMPLE_VOLUME
```

```
PRO VOLUME_ARTEFACT
```

```
;; create a simple volume
```

```
vol = CREATE_SIMPLE_VOLUME()
```

```
;; create the view for the volume
```

```
volView = OBJ_NEW('IDLgrView', VIEWPLANE_RECT=[-1,-1,2,2], $  
    ZCLIP=[2.0, -2.0], COLOR=[150,150,255])
```

```
volModel = OBJ_NEW('IDLgrModel')
```

```
volModel->ADD, vol
```

```
volModel->SCALE,1.5,1.5,1.5
```

```
volView->ADD, volModel
```

```
;; create the render window
```

```
winSize = 200L
```

```
volWin = OBJ_NEW('IDLgrWindow', TITLE="volume transparency",RETAIN=2,  
DIMENSIONS=[winSize,winSize]*2)
```

```
volWin->DRAW, volView
```

```
volModel->ROTATE,[0,1,0],20
```

```
volModel->ROTATE,[1,0,0],30
```

```
volWin->DRAW, volView
```

```
;; litte animation with rotating volume
```

```
IF 1 THEN BEGIN
```

```
    print, "will rotate around y-axis"
```

```
    FOR i=0,20 DO BEGIN
```

```
        print, "step: ",i
```

```
        volModel->ROTATE,[0,1,0],1
```

```
        volWin->DRAW, volView
```

```
    END
```

```
    print, "will rotate around y-axis"
```

```
    volModel->ROTATE,[0,1,0],-15
```

```
    volModel->ROTATE,[1,0,0],-10
```

```
    FOR i=0,20 DO BEGIN
```

```
        print, "step: ",i
```

```
        volModel->ROTATE,[1,0,0],1
```

```
        volWin->DRAW, volView
```

```
    END
```

```
ENDIF
```

```
END
```
