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 litte program that shows the artefacts. I creates a volume, cuts of a cube, and renders 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 off the volume

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