VIRTIS-VEX Tutorial (exercices solution)

Exercice 3

```
Pro exercise3
      sPath= '~/virtis_data/MTP018/VIR0499/'
      sCubeFile='VI0499_01.CAL'
      oCube=virtispds(sPath + 'CALIBRATED/' + sCubeFile, /Silent)
      uSample=50
      uLine=50
      oPlt=Plot($
            oCube.table[*,0,0], $
            oCube.qube[*,uSample,uLine], $
            XStyle=1, $
            XTitle="Wavelength [$\mu m$]", $
            YTitle=oCube.qube_name[0]+" ["+oCube.qube_name[1]+"]" $
      )
End
```

Exercice 4

```
Pro exercise4
      sPath= '~/virtis_data/MTP018/VIR0499/'
      sCubeFile='VI0499_01.CAL'
      oCube=virtispds(sPath + 'CALIBRATED/' + sCubeFile, /Silent)
      uBand=380
      oImg=Image($
            Reform(oCube.qube[uBand,*,*]), $
            Min_Value=0, $
            Dimensions=[ $
                  oCube.qube_dim[1],$
                  oCube.qube_dim[2] $
            ] $
      )
End
```

Exercice 5

```
Pro exercise5
      sPath= '~/virtis_data/MTP010/VIR0268/'
      sCubeFileIR='VI0268_04.CAL'
      oCubeIR=virtispds(sPath + 'CALIBRATED/' + sCubeFileIR, /Silent)
      sCubeFileVIS='VV0268_04.CAL'
      oCubeVIS=virtispds(sPath + 'CALIBRATED/' + sCubeFileVIS, /Silent)
      uSample=50
      uLine=50
      oPltI=Plot($
            oCubeIR.table[*,0,0], $
            oCubeIR.qube[*,uSample,uLine], $
            XStyle=1, $
            XTitle="Wavelength [$\mu m$]", $
            YTitle="Radiance [$Wm^{-2}sr^{-1}\mu m^{-1}$]", $
            Min_Value=0 $
      )
      oPltV=Plot($
            oCubeVIS.table[*,0,0], $
            oCubeVIS.qube[*,uSample,uLine], $
            Min_Value=-0.1, $
            Color='red', $
            /Overplot $
      )
End
```

Exercice 6

```
Pro exercise6
      sPath= '~/virtis_data/MTP018/VIR0499/'
      sCubeFile='VI0499_01.CAL'
      oCube=virtispds(sPath + 'CALIBRATED/' + sCubeFile, /Silent)
      sCubeFileGEO='VI0499_01.GEO'
      uBlind=8
      uBand=380
      oCubeGEO=virtispds(sPath + 'GEOMETRY/' + sCubeFileGEO, /Silent)
      fMirrorCos= Reform(oCubeGEO.qube[32,6,*])
      uMCSz=Size(fMirrorCos,/Dimensions)
```

```
      uIndex=Where( $
            fMirrorCos EQ Max(fMirrorCos) $
      )
      uStop=uIndex-1
      fLon=Reform( $
            oCubeGEO.qube[24,uBlind:*,0:uStop] * $
            oCubeGEO.qube_coeff[24] $
      )
      fLat=Reform( $
            oCubeGEO.qube[25,uBlind:*,0:uStop] * $
            oCubeGEO.qube_coeff[25]
      )
      oImg=Image($
            Reform(oCube.qube[uBand,uBlind:*,0:uStop]), $
            Dimensions=[ $
                  oCube.qube_dim[1]-uBlind,$
                  uStop $
            ] $
      )
      oLat=Contour(fLat,/Overplot,C_Label_Show=1)
      oLon=Contour(fLon,/Overplot,C_Label_Show=1)
End
```

Exercice 7

```
Pro exercise7
      sPath= '~/virtis_data/MTP018/VIR0499/'
      sCubeFileGEO='VI0499_01.GEO'
      oCubeGEO=virtispds(sPath + 'GEOMETRY/' + sCubeFileGEO, /Silent)
      graph=map( $
            'PolarStereographic', $
            FILL_COLOR='light blue', $
;           LIMIT=[-90,-180,0,180], $
            LIMIT=[-90,0,0,90], $
            margin=[0.05,0.05,0.05,0.05] $
      )
      fLat=Reform(oCubeGEO.qube[25,*,*]*oCubeGEO.qube_coeff[25])
      uLatSz=Size(fLat,/Dimensions)
      fMirrorCos= Reform(oCubeGEO.qube[32,6,*])
```

```
      uIndex=Where( $
            fMirrorCos EQ Max(fMirrorCos) $
      )
      uStop=uIndex-1
      fLatNew=[ $
            Reform(fLat[0,0:uStop]), $
            Reform(fLat[*,uStop]), $
            Reform(fLat[uLatSz[0]-1,0:uStop]), $
            Reform(fLat[*,0]) $
      ]
      fLon=Reform(oCubeGEO.qube[24,*,*]*oCubeGEO.qube_coeff[24])
      uLonSz=Size(fLon,/Dimensions)
      fLonNew=[ $
            Reform(fLon[0,0:uStop]), $
            Reform(fLon[*,uStop]), $
            Reform(fLon[uLonSz[0]-1,0:uStop]), $
            Reform(fLon[*,0]) $
      ]
      oPlt=Plot( $
            fLonNew, $
            fLatNew, $
            Symbol='.', $
            Sym_Color='red', $
            /Overplot, $
            Line='none', $
            Color='red' $
      )
End
```

Exercice 8

```
Pro exercise8
      sPath= '~/virtis_data/MTP018/VIR0499/'
      sCubeFile='VI0499_01.CAL'
      oCube=virtispds(sPath + 'CALIBRATED/' + sCubeFile, /Silent)
      sCubeFileGEO='VI0499_01.GEO'
      oCubeGEO=virtispds(sPath + 'GEOMETRY/' + sCubeFileGEO, /Silent)
      uBlind=8
      uBand=380
```

```
      fMirrorCos= Reform(oCubeGEO.qube[32,6,*])
      uIndex=Where( $
            fMirrorCos EQ Max(fMirrorCos) $
      )
      uStop=uIndex-1
      fTempImage=Reform(oCube.qube[uBand,uBlind:*,0:uStop])
      fTempImage[Where(fTempImage LT 0)]=0.
      fLat=Reform(oCubeGEO.qube[25,uBlind:*,0:uStop]* $
            oCubeGEO.qube_coeff[25])
      uLatSz=Size(fLat,/Dimensions)
      fLon=Reform(oCubeGEO.qube[24,uBlind:*,0:uStop]* $
            oCubeGEO.qube_coeff[24])
      Device,decompose=0
      LoadCT,3
      Window,1,XSize=uLatSz[0]*2,YSize=uLatSz[1]*2
      WSet,1
      fImageCopyClipHigh=Max(fTempImage,Min=fImageCopyClipLow)
      fLatCenter=fLat[(Size(fLat))[1]/2,(Size(fLat))[2]/2]
      fLonCenter=fLon[(Size(fLon))[1]/2,(Size(fLon))[2]/2]
      fLonMin=Min(fLon)
      fLonMax=Max(fLon(Where(fLon NE 200.)))
      fLatMin=Min(fLat)
      fLatMax=Max(fLat(Where(fLat NE 200.)))
      Map_Set, fLatMin, fLonMin, limit=[fLatMin,fLonMin,fLatMax,fLonMax], $
            /Albers, /Isotropic, /Horizon, XMargin=5
      fImageCopy=bytscl(fTempImage)
      bMap_v=Map_Patch(fImageCopy, fLon, fLat, XStart=Startx, $
            YStart=Starty, XSize=sizex, YSize=sizey)
      Map_Grid, latdel=10, londel=10,/Box_Axes,/Label
      Device,Decompose=1
      LoadCT,0
      Tv, bMap_v, Startx, Starty
      Map_Grid, latdel=10, londel=10,/Label,Color=0
End
```