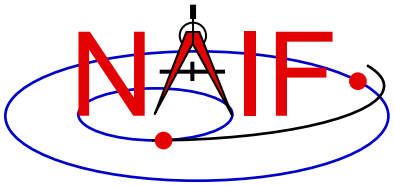


Navigation and Ancillary Information Facility

Instrument Kernel
IK

January 2017

Purpose

- **The Instrument Kernel serves as a repository for instrument specific information that may be useful within the SPICE context.**
  - **Always included:**
    - » **Specifications for an instrument's field-of-view (FOV) size, shape, and orientation**
  - **Other possibilities:**
    - » **Internal instrument timing parameters and other data relating to SPICE computations might also be placed in an I-kernel**
    - » **Instrument geometric calibration data**
    - » **Instrument detector geometric parameters**
    - » **Instrument optical distortion parameters**

- **Note: instrument mounting alignment data are specified in a mission's Frames Kernel (FK)**
  - **Wasn't true for some of the earliest missions that used SPICE**

I-Kernel Structure

- **An I-Kernel is a SPICE text kernel. The format and structure of a typical I-Kernel is shown below.**

```
KPL/IK
   Comments describing the keywords and values
   to follow, as well as any other pertinent
   information.

      \begindata
         Keyword = Value(s) Assignment
         Keyword = Value(s) Assignment

      \begintext

   More descriptive comments.

      \begindata
         Keyword = Value(s) Assignment
      \begintext

   More descriptive comments.
            etc ...
```

FOV Definition Keywords (1)

- **The following keywords defining FOV attributes for the instrument with NAIF ID (#) must be present in the IK if the SPICE Toolkit's GETFOV module will be used**
  - **Keyword defining shape of the FOV**

```
INS#_FOV_SHAPE      = 'CIRCLE' or 'ELLIPSE' or
                      'RECTANGLE' or 'POLYGON'
```

  - **Keyword specifying the reference frame in which the boresight vector and FOV boundary vectors are specified**

```
INS#_FOV_FRAME      = 'frame name'
```

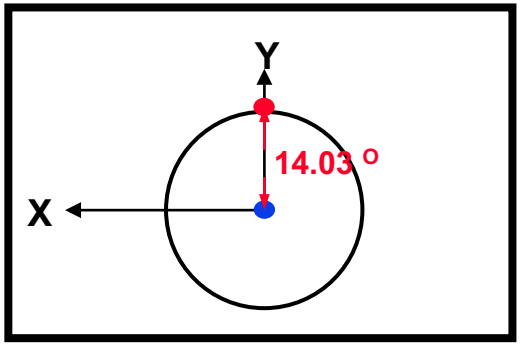
  - **Keyword defining the boresight vector**

```
INS#_BORESIGHT      = ( X, Y, Z )
```

continued on next page

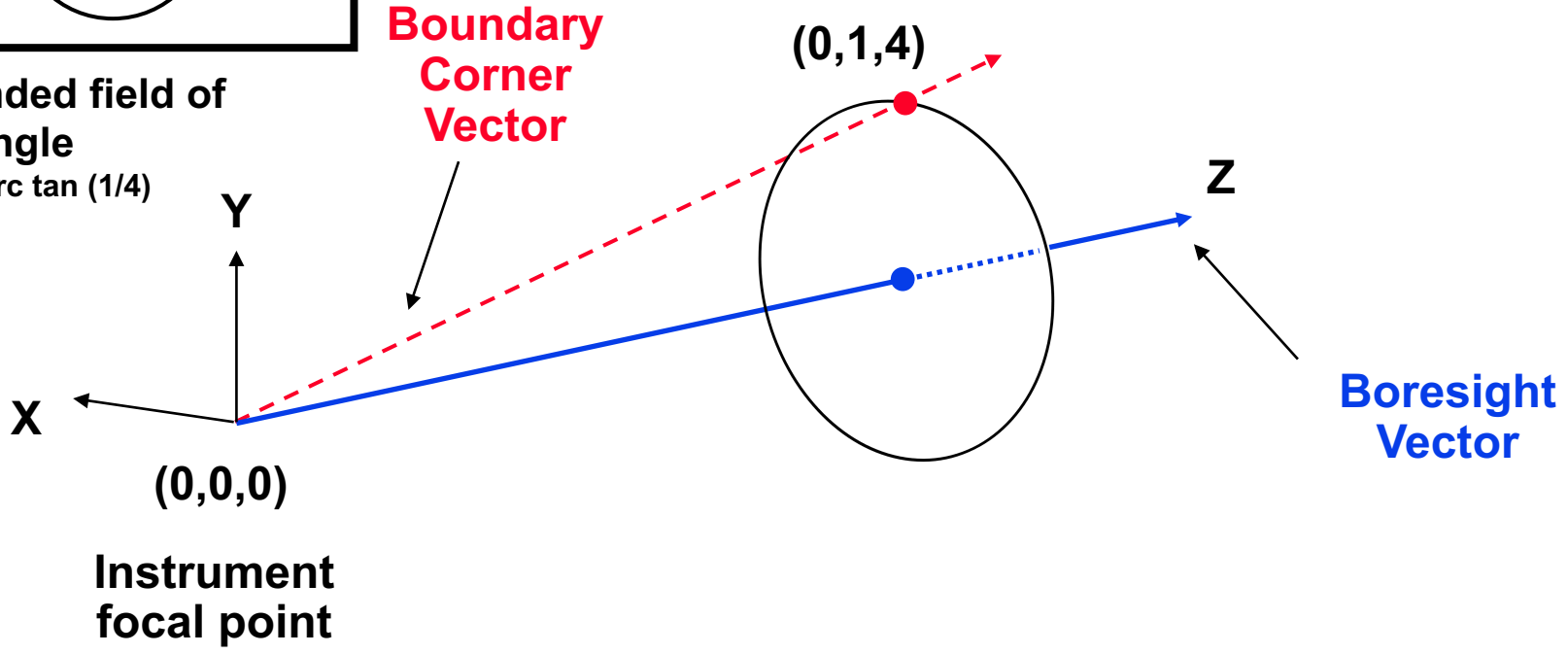
Circular Field of View

Consider an instrument with a circular field of view.



Subtended field of view angle

14.03 = arc tan (1/4)



Rectangular Field of View

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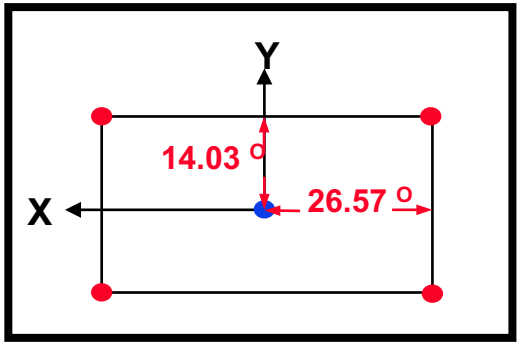
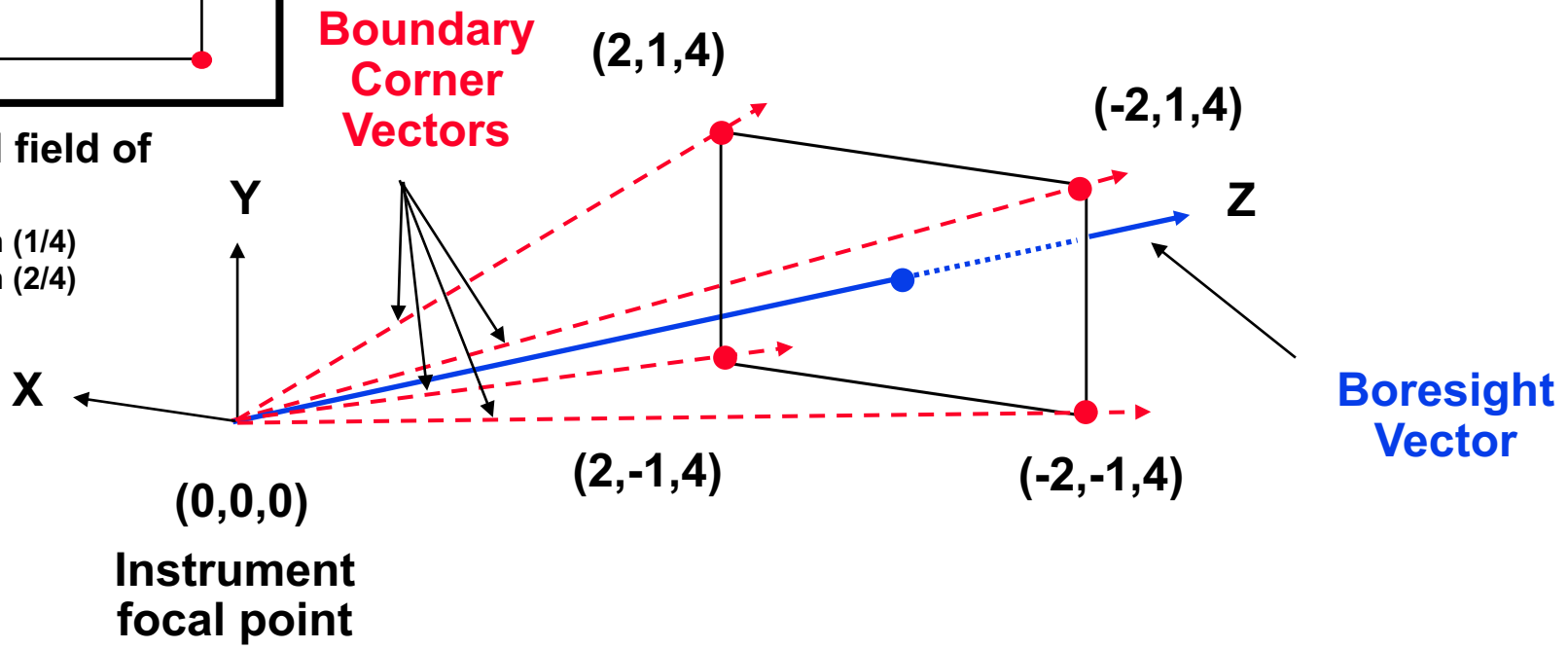
Consider an instrument with a rectangular field of view.



Subtended field of view angle

14.03 = arc tan (1/4)

26.57 = arc tan (2/4)



Polygonal Fields of View

Consider an instrument with a trapezoidal field of view.