

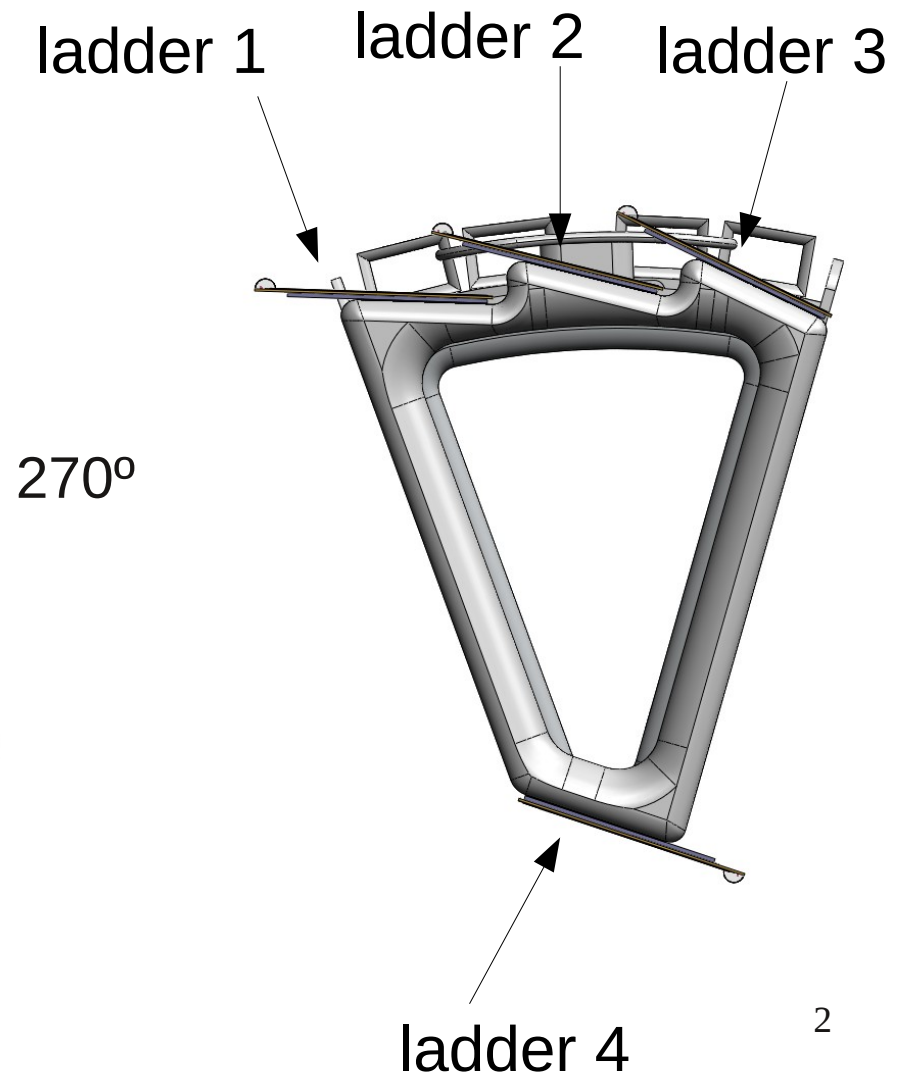
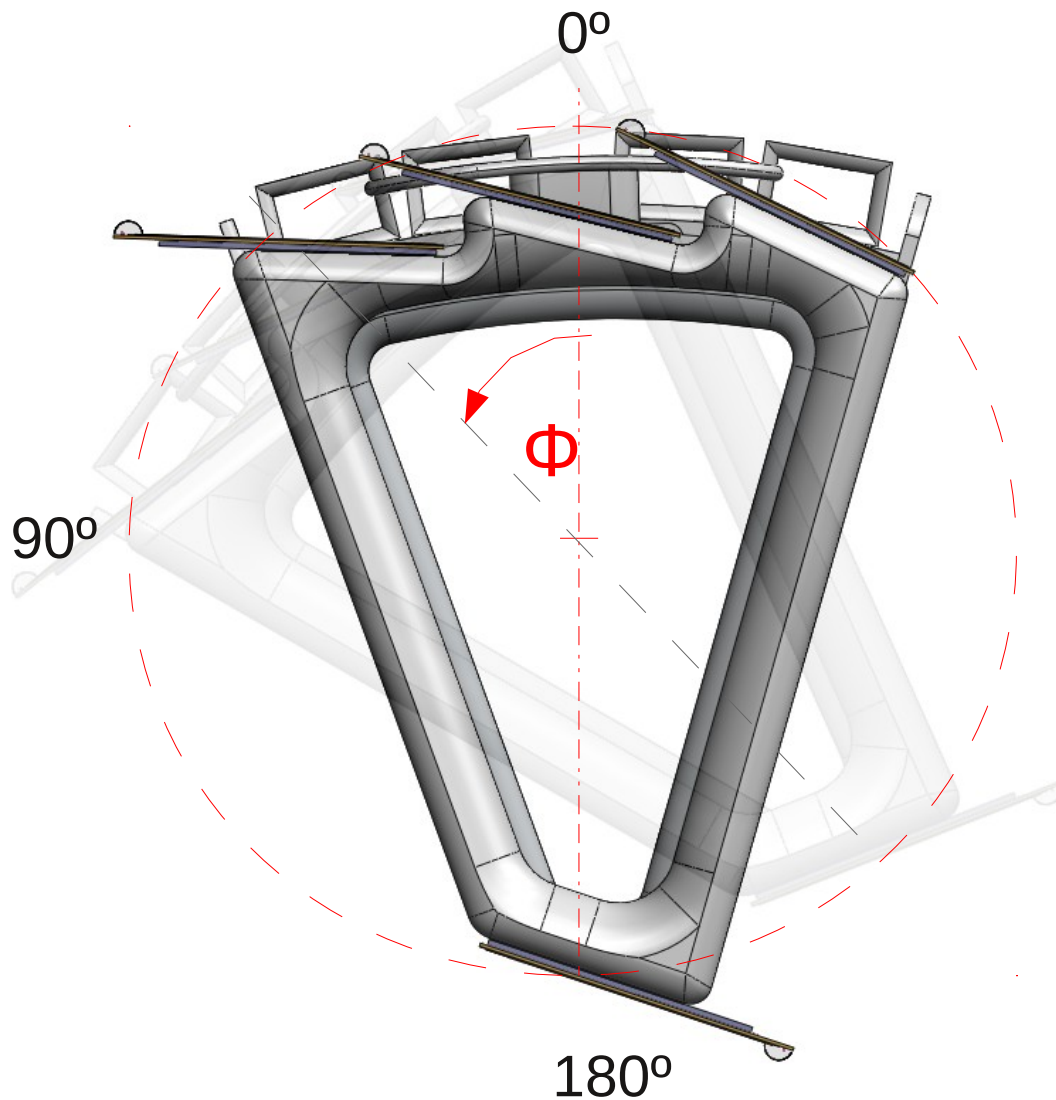
# Pixel Sector Survey

- suggested procedure -

4/20/2012

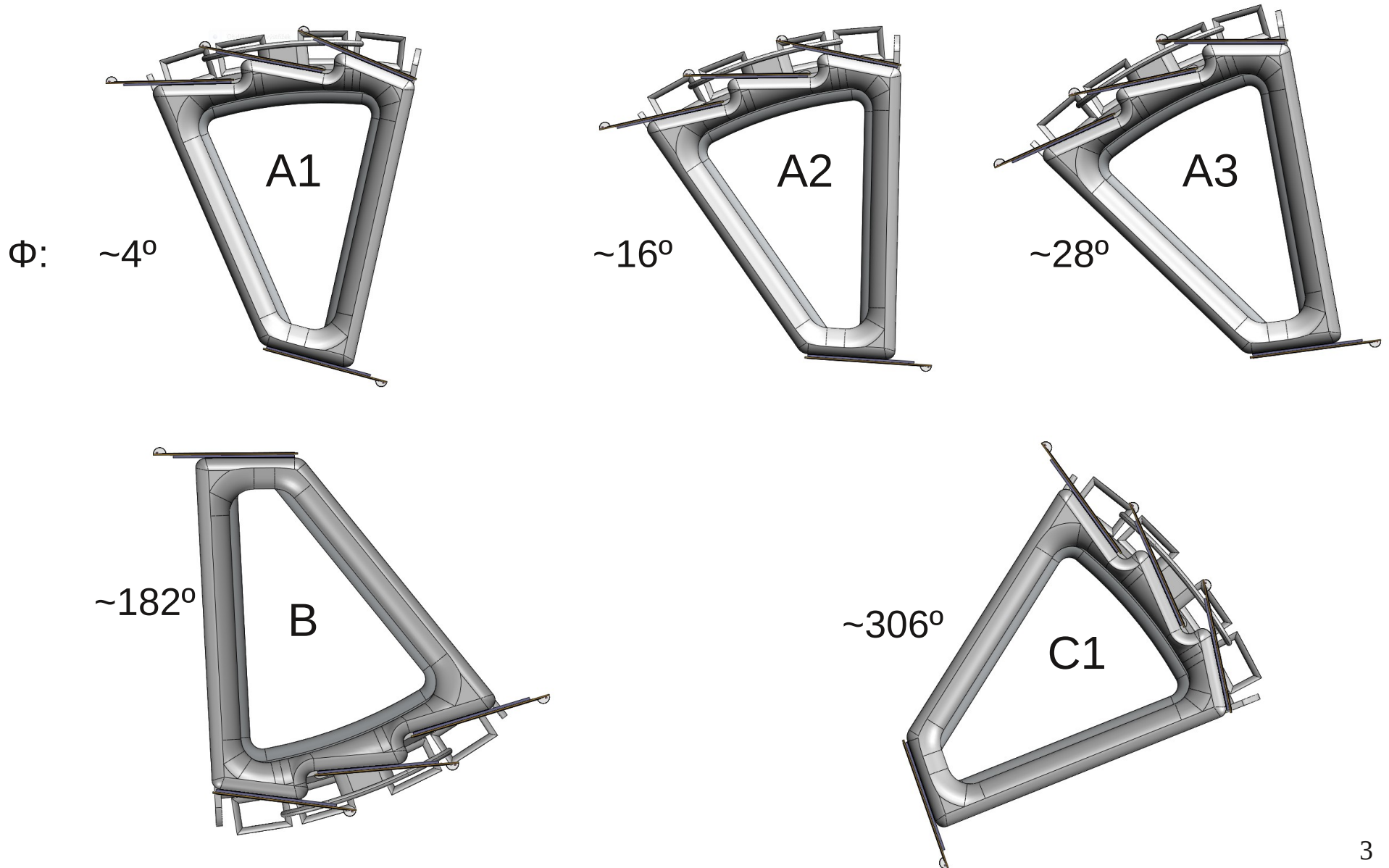
Jan Rusnak

# Conventions used in this presentation:

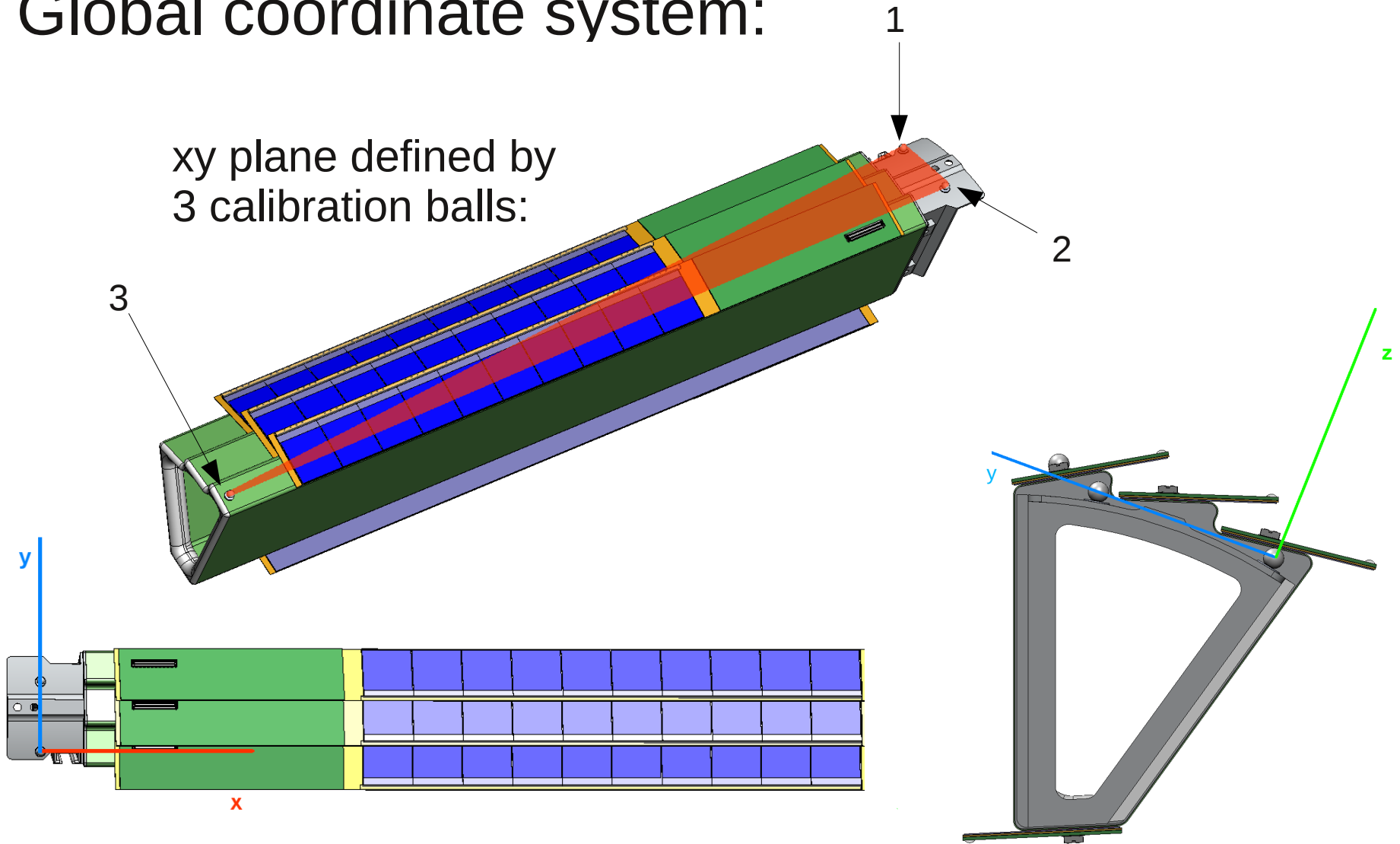


# Conventions used in this presentation:

Sector positions:

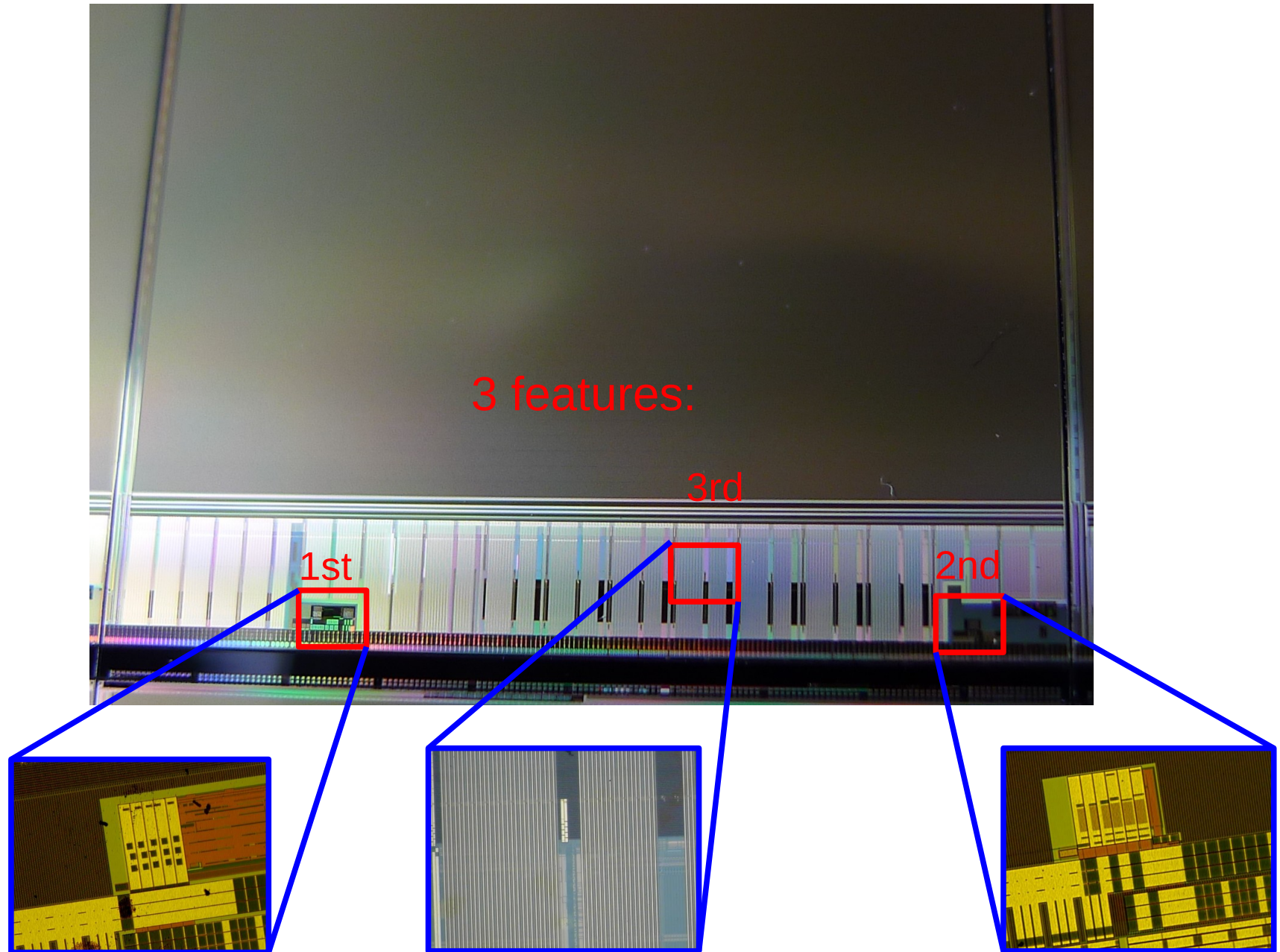


# Global coordinate system:

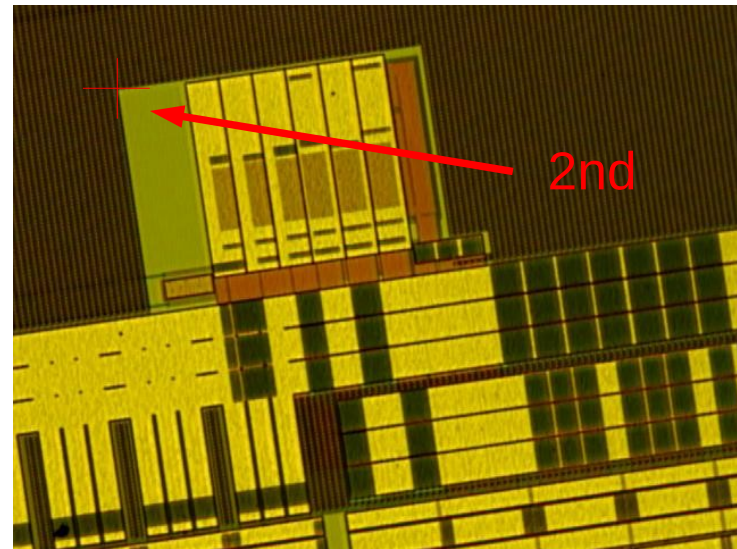
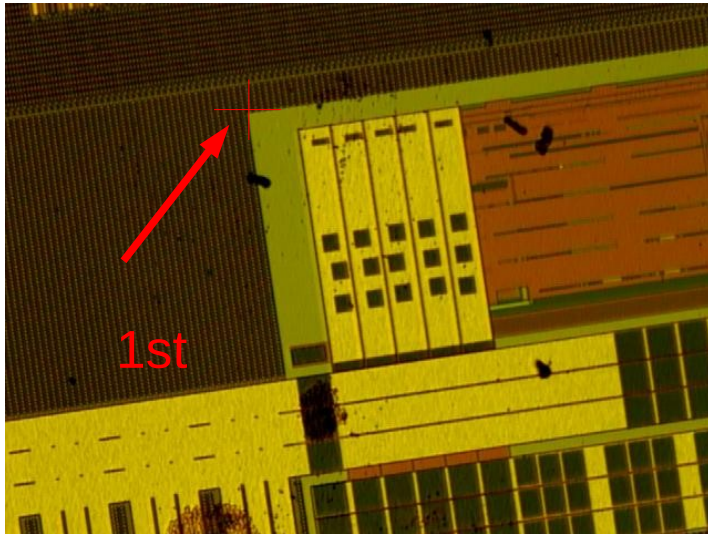


- xy plane ( $z=0$ ) formed by the centers of all 3 balls
- origin placed to the center of the 1st ball
- y axis aligned with the center of the 2nd ball

# Local coordinate system:

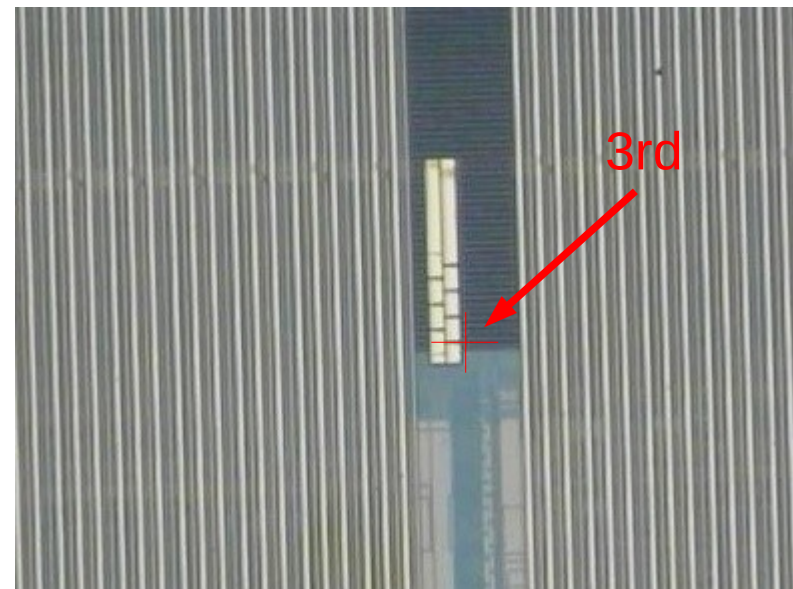


# Local coordinate system:



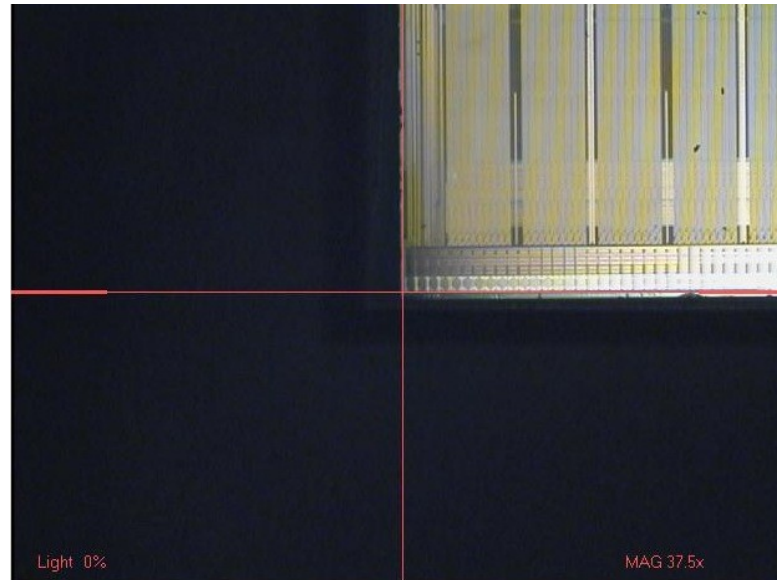
1st feature:  
 $x=4594.225 \mu\text{m}$   
 $y=920.775 \mu\text{m}$

2nd feature:  
 $x=18165.075$   
 $y=871.6 \mu\text{m}$



# Local coordinate system:

- xy plane defined by 3 feature points
- position of the origin and x-axis direction defined by the coordinates of 1st and 2nd feature
- to set-up the coordinate system in such a way is pretty tough task with the MeasureMind3D software, however, it is not impossible [1]



*Origin position*

[1] [http://drupal.star.bnl.gov/STAR/system/files/coord\\_transform.pdf](http://drupal.star.bnl.gov/STAR/system/files/coord_transform.pdf)

# Suggested Survey Procedure



- 1) position A1
  - measure 3 calibration balls -> set-up (global) coordinate system **GCS**
  - measure (**visible part** of) 1st ladder using the optics:
    - measure all 3x10 features (in global coordinate system **GCS**) //F1
    - measure NxM1 points in local coordinate system **LCS**,  
repeat for all ten chips //P1
- 2) position A2
  - set-up **GCS**
  - measure (**visible part** of) 2nd ladder using the optics //F2, P2
- 3) position A3
  - set-up **GCS**
  - measure the **whole** 3rd ladder using the optics
    - measure all features (in global coordinate system **GCS**) //F3
    - measure Nx(M1+M2) points in local coordinate system **LCS**,  
repeat 10x //P3
  - reset the **GCS!** (step P3 ends up with a **LCS**)
- 4) position B
  - use the previous **GCS!**
  - measure the **whole** 4th ladder using the optics
    - measure all features in **GCS** //F4
    - measure Nx(M1+M2) points in local coordinate system **LCS**,  
repeat 10x //P4
  - if scenario2=true: reset the **GCS!**

5) position C1 \*

- measure 3 calibration balls \*\* -> set-up GCS
- measure 1st ladder using the touch probe (feather probe)
  - measure N'xM' points in global coordinate system GCS/GCS //T1
- measure 2nd ladder using the touch probe (feather probe)
  - measure N'xM' points in global coordinate system GCS/GCS //T2
- one can also measure the 3rd ladder with the feather probe - just for comparison with the optical measurement

\*) one position should be sufficient to measure both 1st and 2nd ladder

\*\* ) if it will be possible (scenario1), otherwise use the previous GCS (scenario2)

suggested values:

N=11, M1+M2=12, N'=110, M'=12

## What we get:

- features on ladder 4 (F4) will be measured in rotated **GCS** -> they have to be transformed to their “natural” **GCS**
- points measured with the feather probe (T1,2) will be either in their “natural” **GCS** (scenario1) or they will be in rotated **GCS** -> need to transform to **GCS** (scenario2)
- features on ladders 1,2,3 (F1,2,3) will be in **GCS**
- points measured with the optics (P1,2,3,4) will be in **LCS** -> need to transform to **GCS**

=> at the end all the points will be saved in one coordinate system - **GCS**

