PXL Survey – Offline Alignment Interface

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"…The framework for going from the survey data of ladders chips to parameterization and populating the STAR Databases (DB) is not fully developed. Some of the steps have been investigated. It is important to have this in place, when the engineering run sectors have been produced and ready for survey late this year or early January.
It was presented as being part of planned activities…"

Committee Report from Alignment Procedures Review, BNL Oct. 12 2012

Offline Structures

Fixed for all HFT detectors

Fixed by PXL SURVEY

HFT PXL

$$PG = Tpc2Global \ast GL \ast PI \ast DP \ast SD \ast WLL;$$

PXLInGlobal=Tpc2Magnet*IDS2Tpc*PXL2IDS*DShell2PXL*Sector2DShell*(Pxl-Sector)

Fixed for PXL by Offline

Assumptions

- Survey and Offline systems will differ. Data formats will differ too. Transform from one system to other possible.

- Origin of coordinate systems should be as close as possible to geometrical center of the module -> minimize effects
  - easy to work also with GEANT volume-placing matrices
  - unless there is a clear reason for not doing this

- Sensor center is center of active area

- Ladder center in-between sensors 5-6 (geometrical center)

- Sector center (proposed) to be the innermost (ladder #4) center due to the importance of first layer, rotated 180 by necessity (see next slide)

- TPS fits are assumed to be done on single sensor basis
  - pixel functions/parameters will be tagged with sensor ID

Definitions
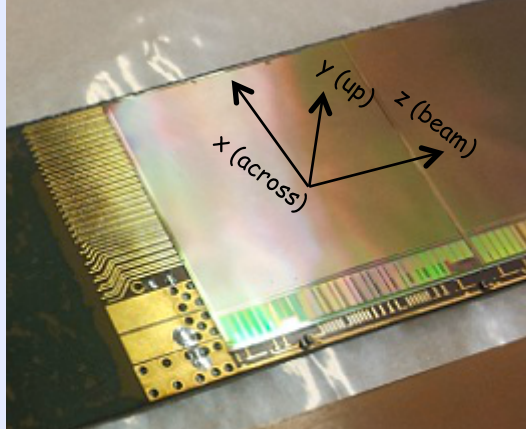
Global Coordinates
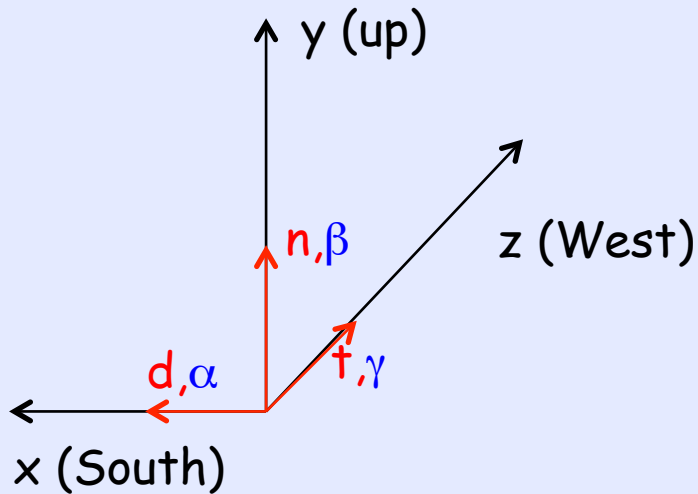
Local Coordinates
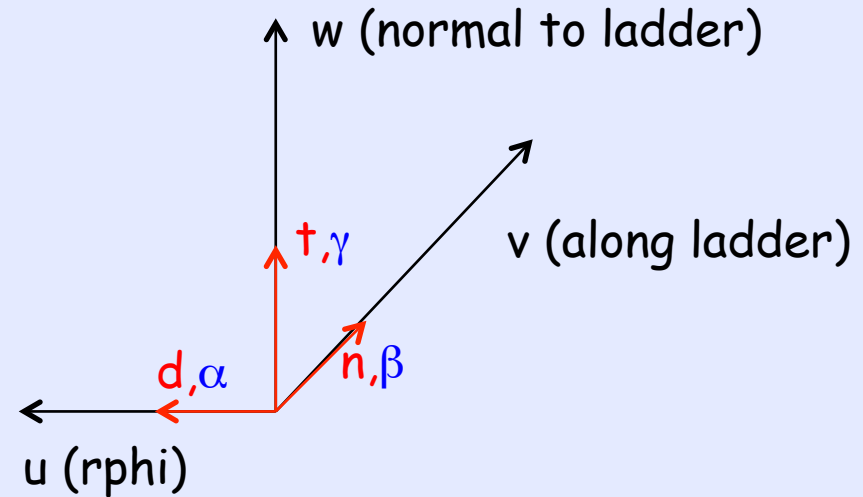
- Local v (along ladder) is fixed and along global z
- Local w (normal to wafer plane) is fixed (points away from the interaction point (SSD/IST/PXL outer layer ladders) or away from the glued surface)
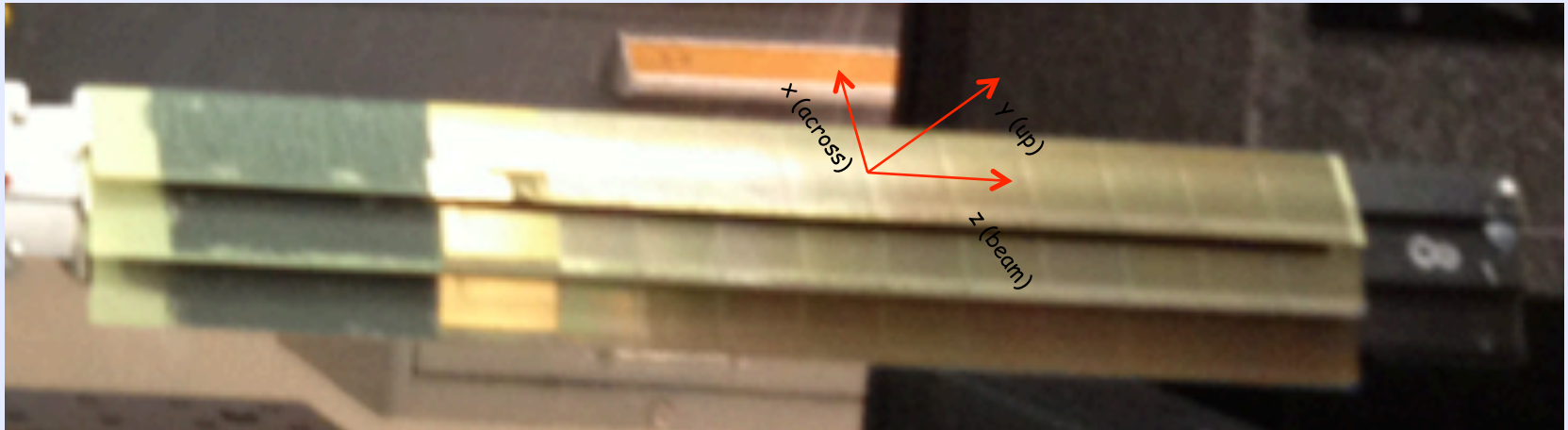- Local u (rphi on wafer plane) varies so it forms a RHS with v-w

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Local PXL system definitions (offline)

sensor

- Sector has same definition as STAR
  - use same convention as in SSD/IST to simplify software

ladder

Offline Structures

HFT PXL

PG $\quad$ = Tpc2Global *GL $\qquad$ * PI $\qquad$ *DP $\qquad$ * SD $\qquad$ * WLL;

PXLInGlobal=Tpc2Magnet*IDS2Tpc*PXL2IDS*DShell2PXL*Sector2DShell*(Pxl-Sector)

Survey Structures

HFT PXL

WLL $\quad$ = LS $\qquad$ * SL $\qquad$ * PS (TPS fn);

PXLInSector=Ladder2Sector*Sensor2Ladder*Pxl2Sensor