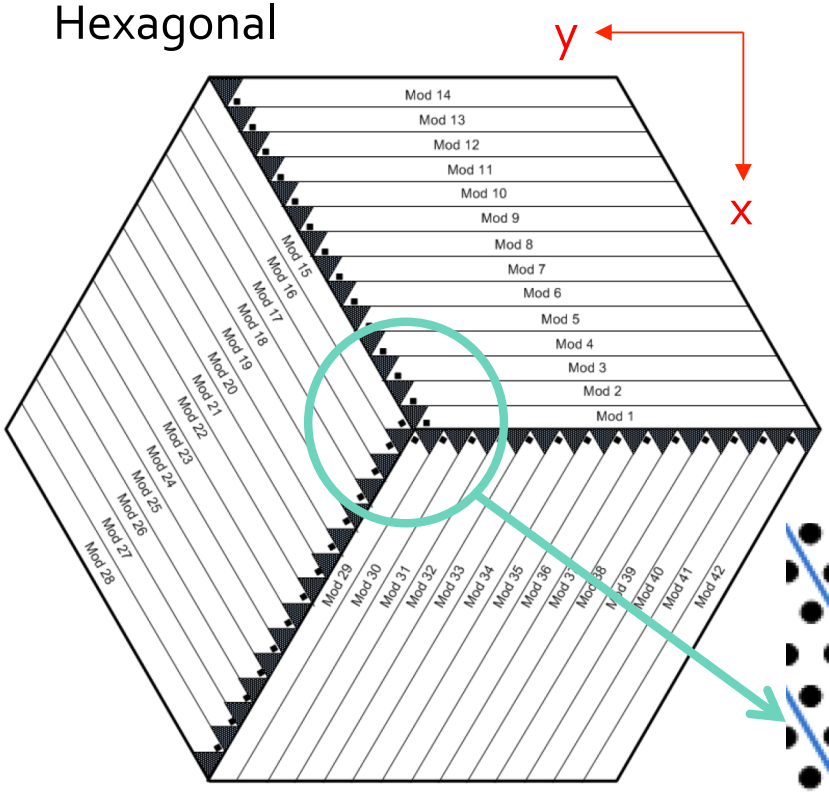
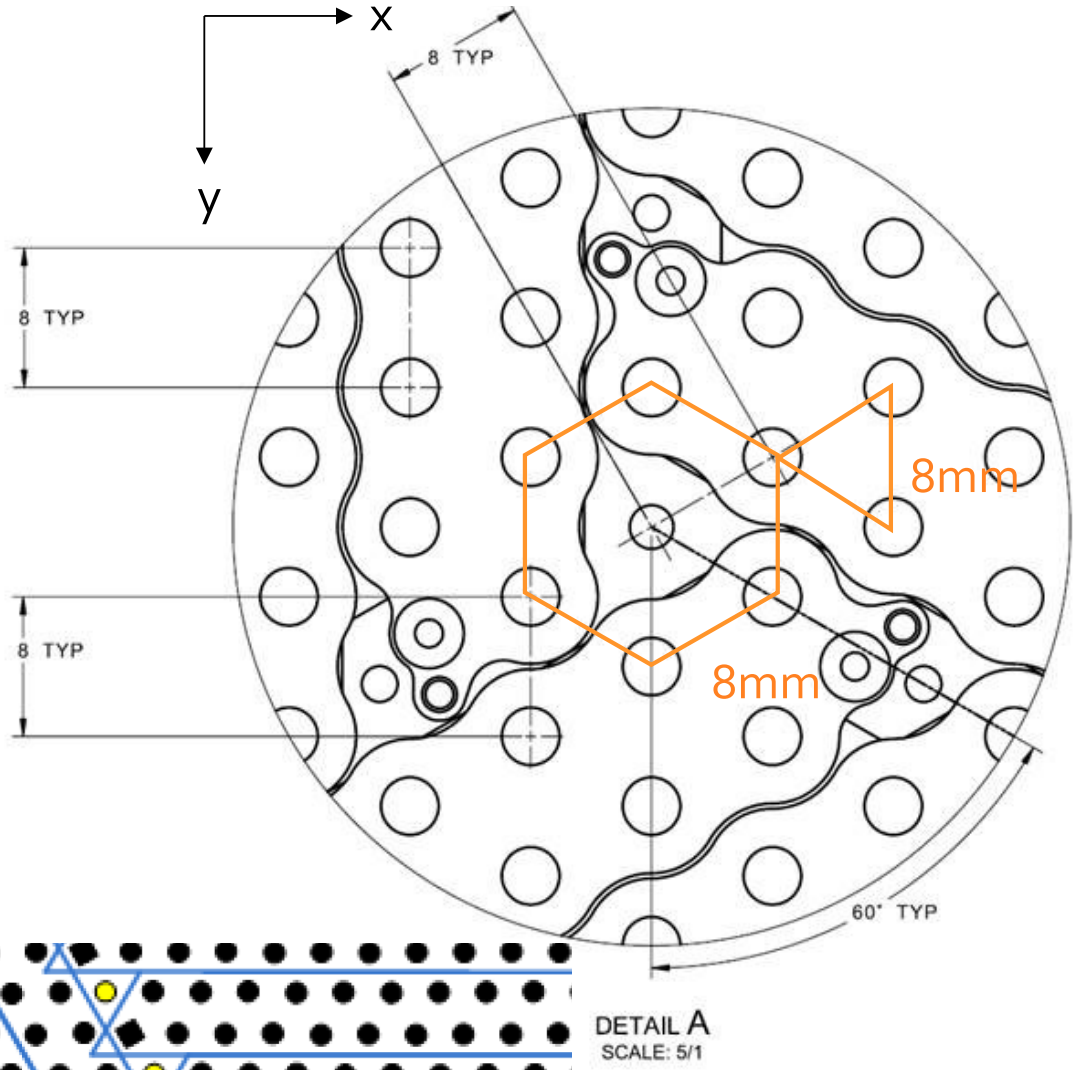
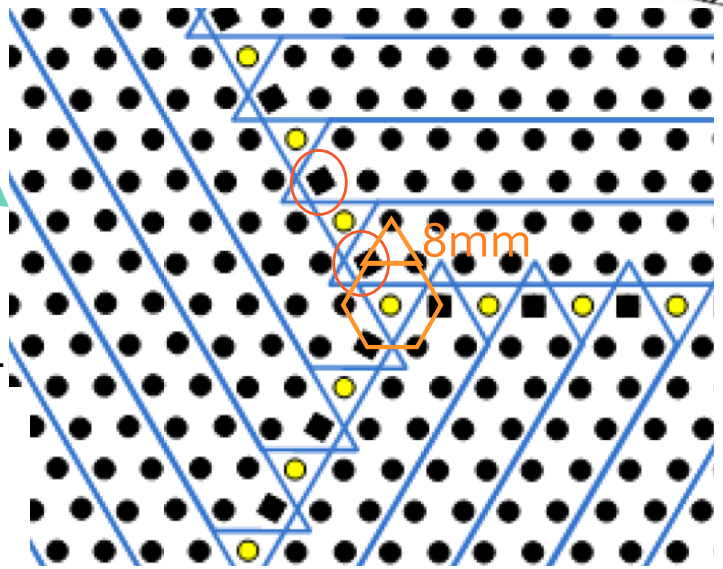
Cobras position

- Cobra patrol area: 9.5mm diameter
- minimum separation of cobras: 2mm
- Cobras are tiled in 8mm –pitch Hexagonal







DETAIL A
SCALE: 5/1

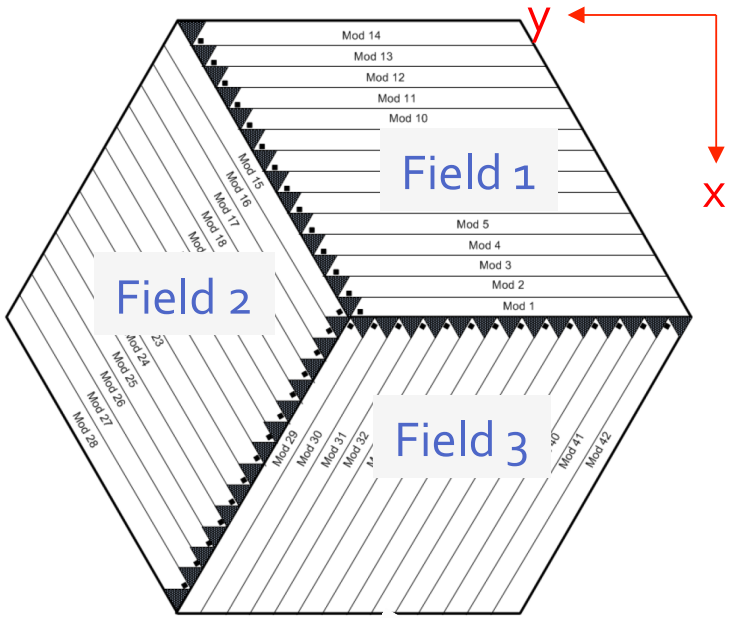
Ron Steinkraus
PFI Focal Plane Fiber Identification.

the cobra modules orientation on PFI(X,Y)
http://sumire.pbworks.com/w/file/fetch/94703507/COB%20Fields%20x%20MP1%20rulers.pdf
https://pfs.ipmu.jp/bts/show_bug.cgi?id=377 -> Option3

Cobras position (cont'd)

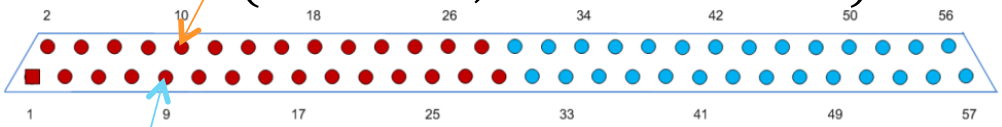
- The position of #1 cobra of each module:
  - Field 1 (module 1--14) $(8l\cos150°, 8l\sin150°)$
  - Field 2 (module 15--28) $(8l\cos30°, 8l\sin30°)$
  - Field 3 (module 29--42) $(8l\cos270°, 8l\sin270°)$

    $l=2k-1$ ($k=1,2,\ldots14$) for each field
- offsets from #1 cobra



Field 1

#n even (n=2m+2):
$(8\cos210°, -8m+8\sin210°)$



#n odd
(n=2m+1): $(0, -8m)$

#n odd
(n=2m+1):
$(8m\cos30°, 8m\sin30°)$

Field 2

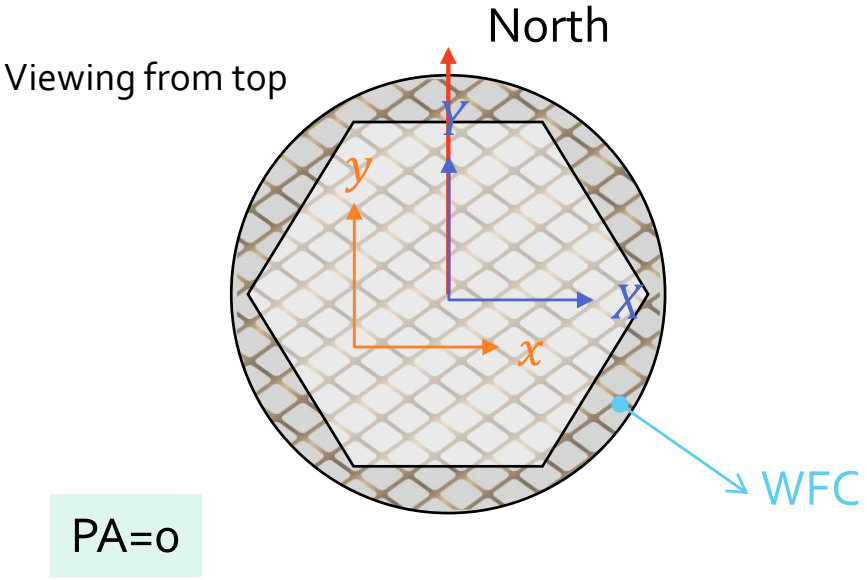
#n even
(n=2m+2):
$(8m\cos30° + 8\cos(-30°), 8m\sin30° + 8\sin(-30°))$

#n odd
(n=2m+1):
$(8m\cos150°, 8m\sin150°)$

#n even
(n=2m+2):
$(8m\cos150°, 8m\sin150° + 8)$

Field 3

Appendix



sky coordinate: (x, y) [deg]

* offset from the FoV center
* input position to WFC
* fixed to WFC

PFI coordinate: (X, Y) [mm]

* rotates with Cobra (instrument).

Conversion Function

- $X = f(x, y)$
- $Y = g(x, y)$

* PA=0
* If PA≠0, input position to WFC rotates. Then, function becomes as follows:
  - $X = f(x', y')$
  - $Y = g(x', y')$
  - $\begin{pmatrix} x' \\ y' \end{pmatrix} = R(PA) \begin{pmatrix} x \\ y \end{pmatrix}$, $R(PA)$ is rotation matrix.