Progress on the online tracking algorithm

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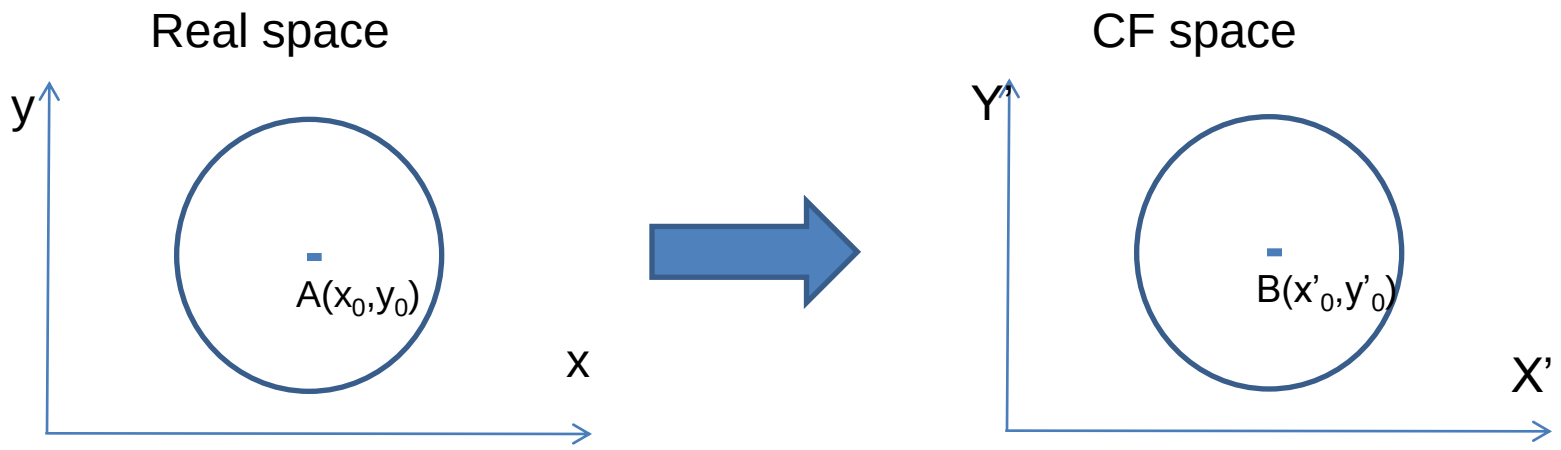
Circle transform to CF space → Circle



Center: (x_0, y_0)
Radius: r

Center: $(x_0/R, y_0/R)$
Radius: r/R
Here, $R=x_0*x_0+y_0*y_0-r*r$

Previous bug: $A(x_0,y_0) \xrightarrow{CF} (x_0/(x_0*x_0+y_0*y_0),\ y_0/(x_0*x_0+y_0*y_0)) \ != B(x'_0,y'_0)$

Thanks Gianluigi for point this out.

Reason of Pt resolution not improve at large Hough space

Pt resolution at different Hough space

Hough Space	1024^2	4096^2	16384^2	65536^2
Truth position as input	4.8%	3.3%	3.1%	2.6%
Ideal drift distance as input	5.4%	3.4%	3.0%	2.7%
Realistic drift distance as input	5.3%	3.2%	3.2%	3.2%

Truth position as input: No drift circle, but the accurate position of each point is used.

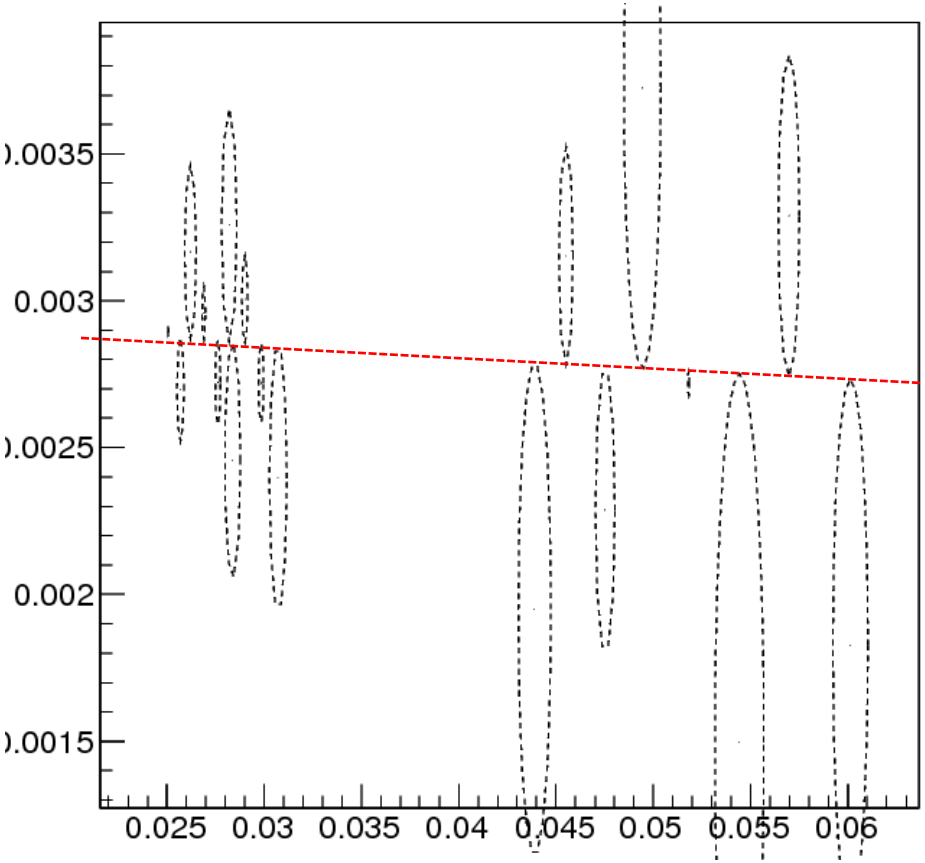
Ideal drift distance as input: The drift circle is perfect. (no error in the drift distance)

Realistic drift distance as input: fast approximation from the true distance to the reconstructed one, using Juelich exp curve COSY-TOF

Conclusion:

1. The way we deal with drift circle is already very good.
2. Pt resolution does not improve at large Hough space, due to error of drift distance

Ideal drift circle



Realistic drift circle