

# RP calibration for Run7

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# Calibration status

- Sample coefficients for 592 runs were got.
  - Use CNT\_MB test pro76
  - RxNP and MPC were added in RP calibrator.
- The coefficients are uploaded to data base on va machine.
- I confirmed re-calibrator was worked for run7 on va machine.
  - RxNP and MPC were added in RP re-calibrator.
  - I confirmed it for run5, too.

# RP calibration method

- RP calculation

- We can calculate RP from Sum of (x,y) position.

- $$\Psi_{raw} = \frac{1}{n} \arctan 2(y, x)$$

- Distribution of the raw RP is not flat although RP distribution should be flat.

- Calibration step 1 “SumXY”

- Center of particle distribution is calibrated to (0,0).

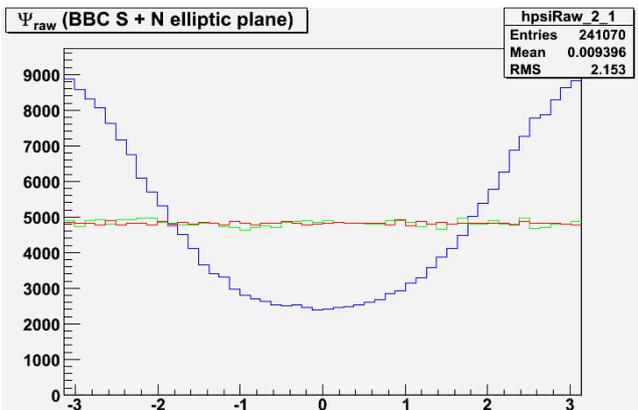
- Calibration step 2 “Flattening”

- The influence from other is calibrated by Fourier series .

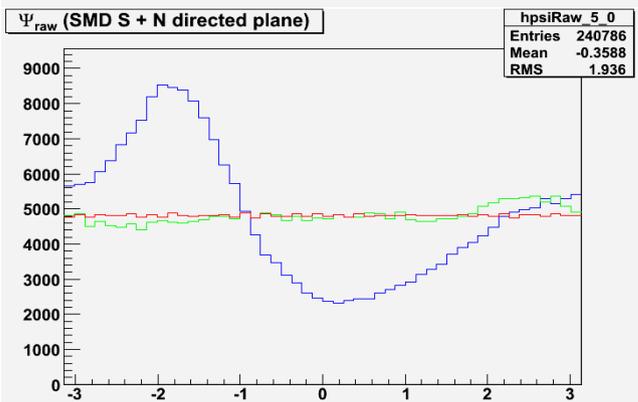
- $$\Psi = \Psi_{observe} + \sum_n \{ A_n \cos(n \Psi_{obs}) + B_n \sin(n \psi_{obs}) \}$$

# Calibration of 2 step

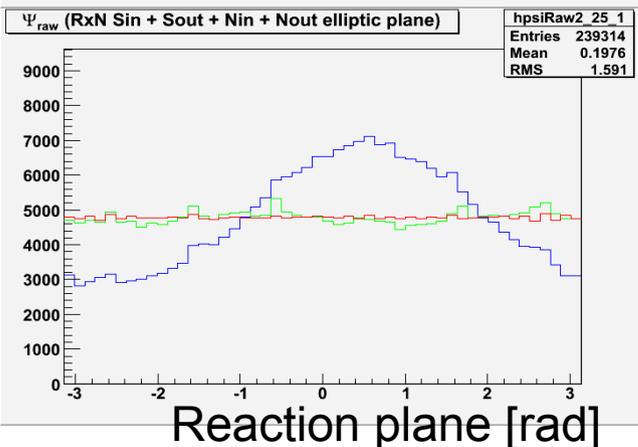
BBC



SMD

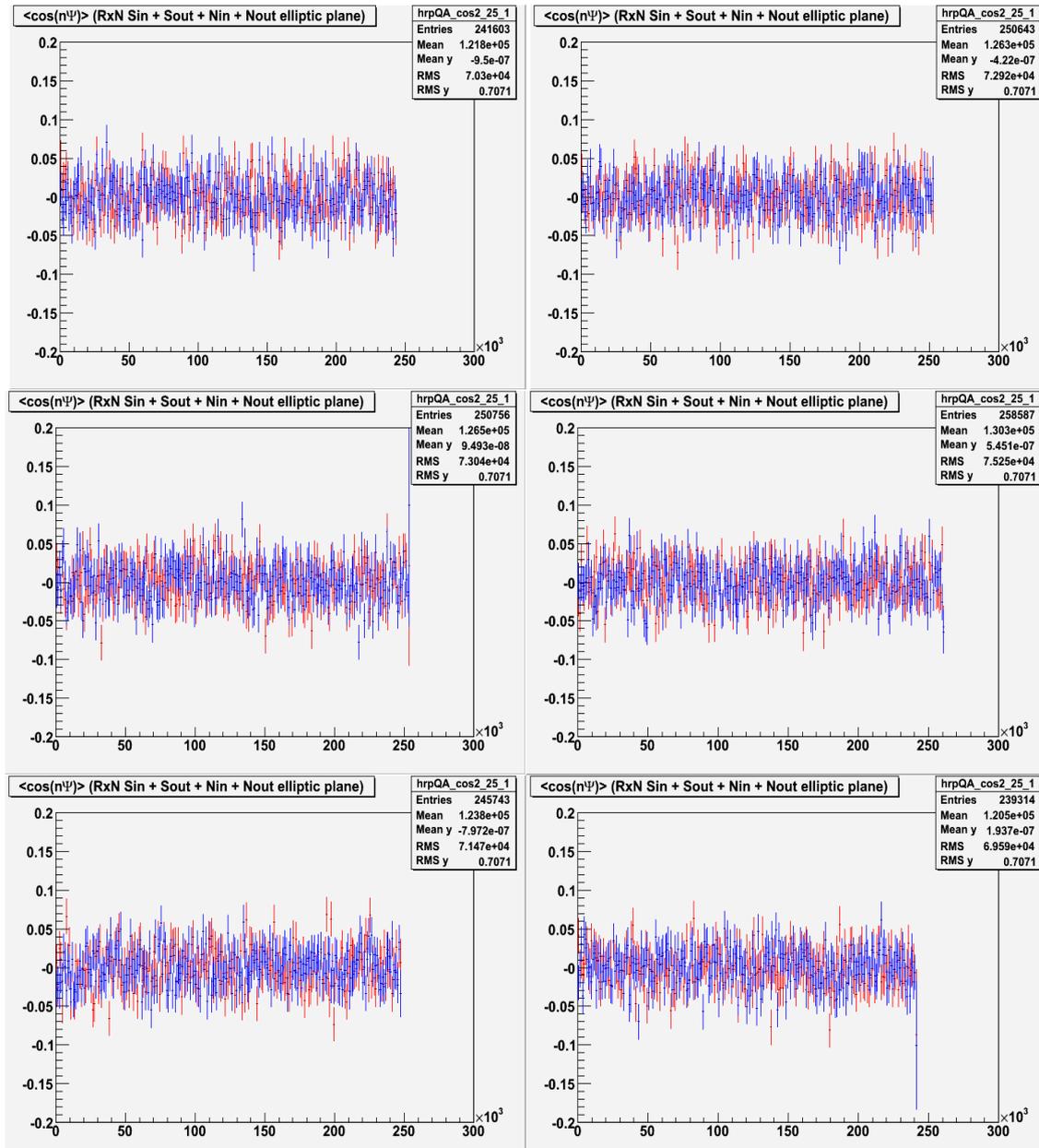


RxNP



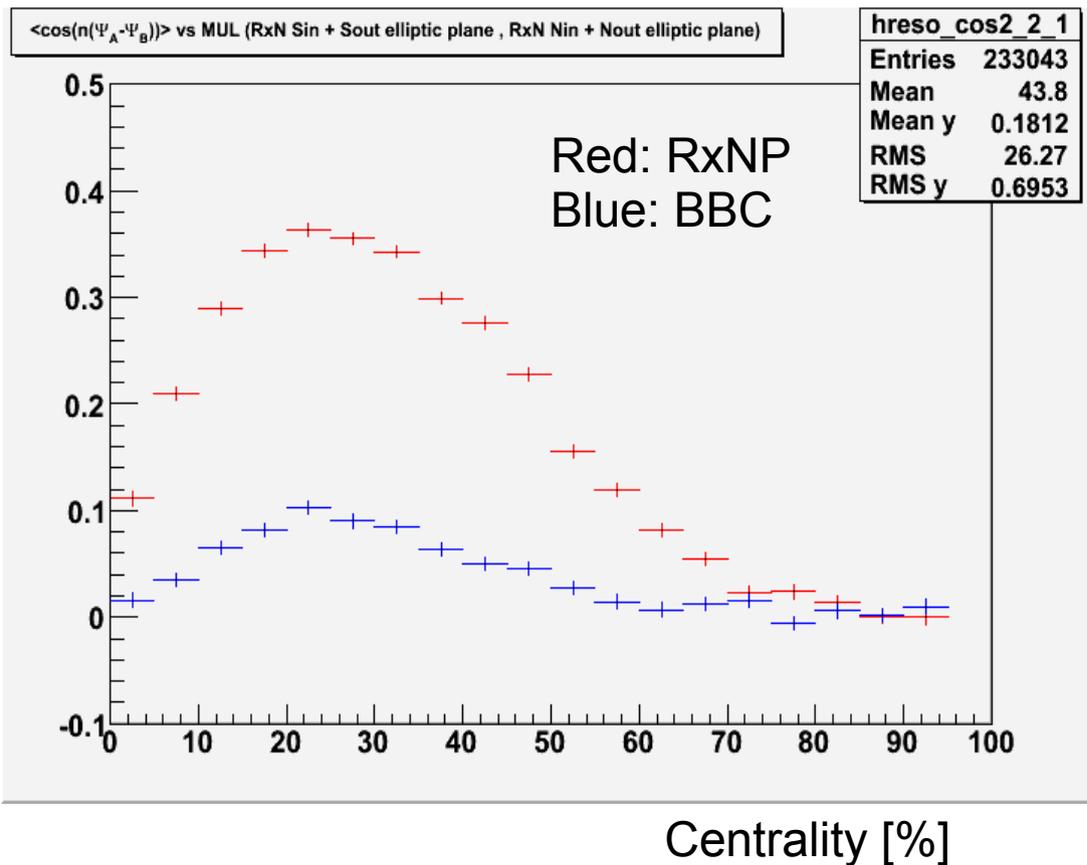
- This picture is RP distribution.
  - Horizontal axis: Reaction plane [rad]
- Blue: Before calibration
- Green: After SumXY calibration
- Red: After flattening calibration

# Calibration check



- Red is  $\langle \cos(n\Psi) \rangle$   
Blue is  $\langle \sin(n\Psi) \rangle$ 
  - Horizontal axis: events
- These distribution should be around 0 (should be flat).
- I found values of chi-square/ndf every runs and summarized them under.

# RP resolution

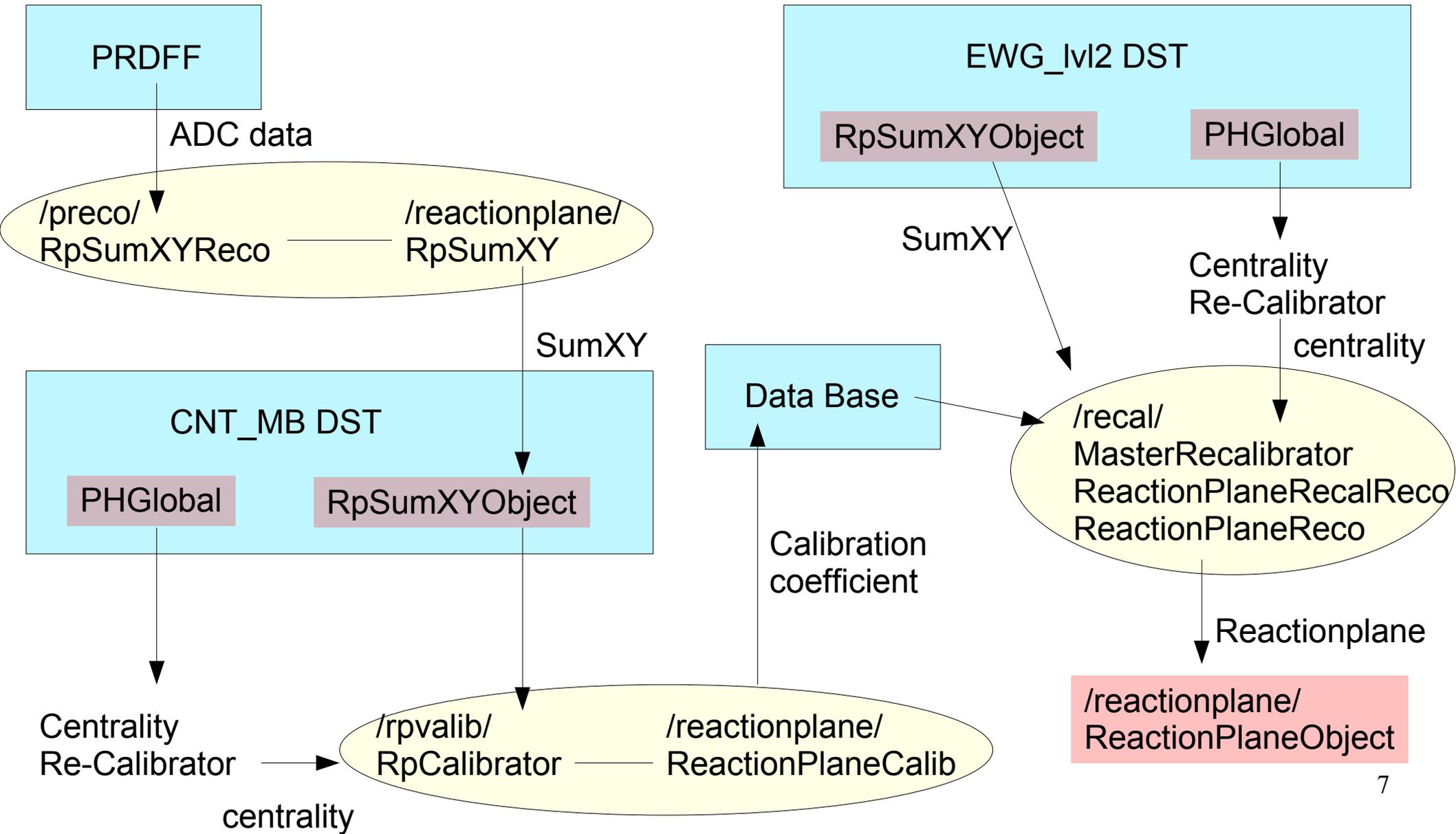


- We can estimate resolution by difference RP between south and north

$$- \cos \{ 2 (\Psi_{south} - \Psi_{north}) \}$$

- The resolution is almost the square root of this value.

# Calibration flow



# Summary and To do

- Preparation for Calibrator and re-calibrator is complete.
- Test coefficients are stored in DB on va machine, now.
- Wait centrality calibration for full production.
  - BBC calib -> Centrality calib -> RP calib
  - RP Calibration for full production, again.
  - And update DB, again.