

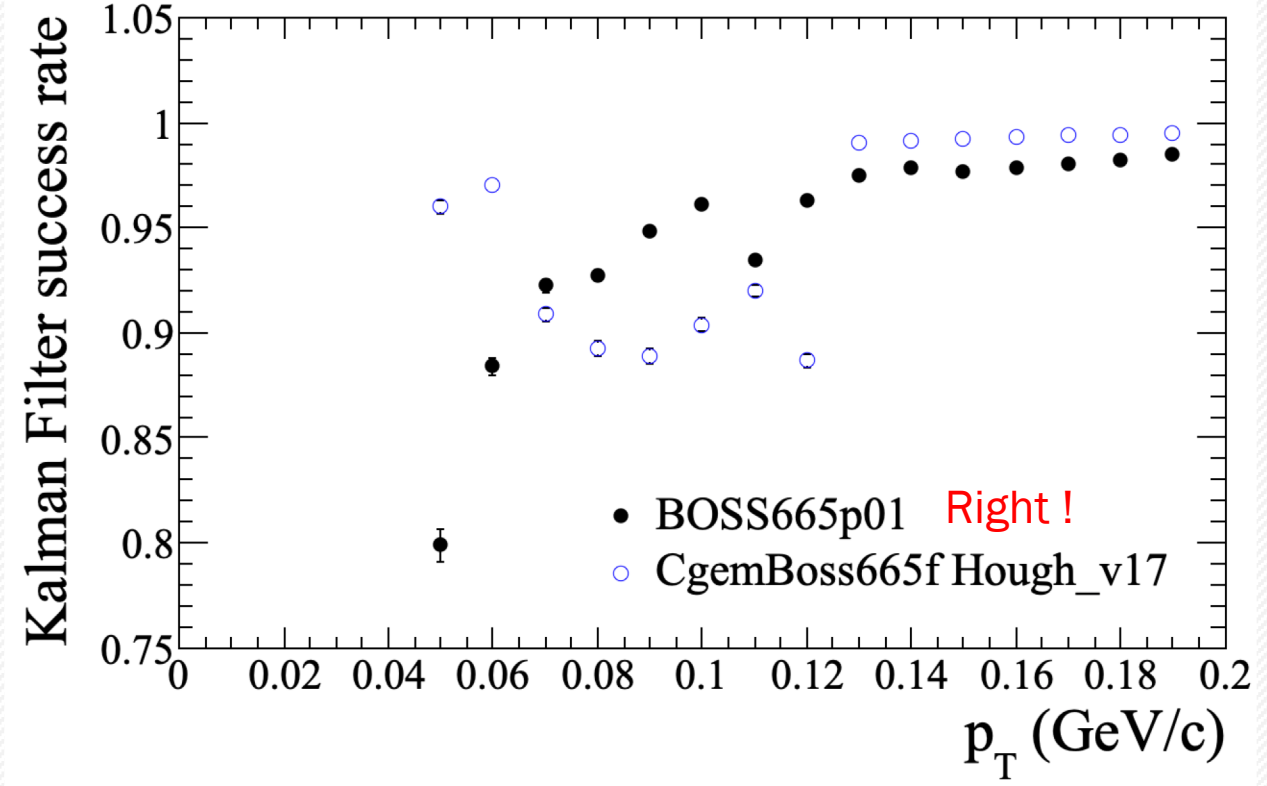
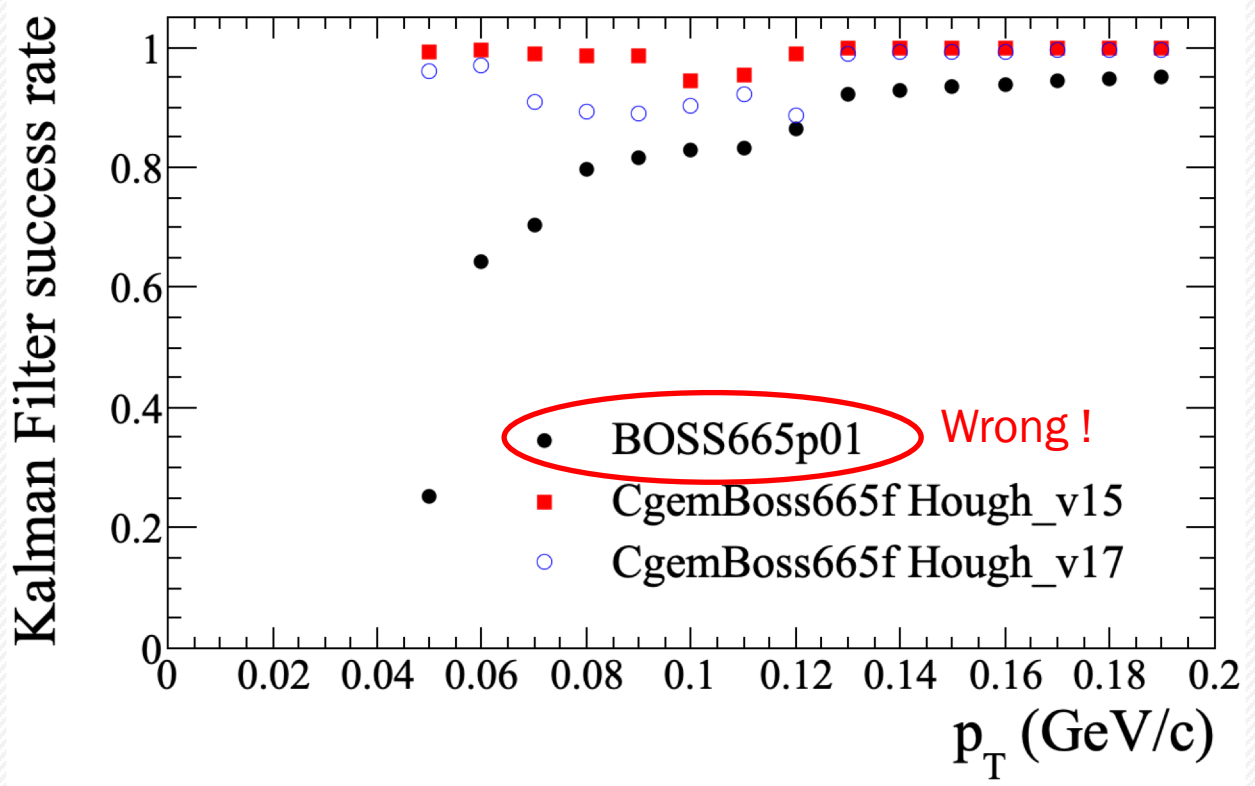


Status of track reconstruction with CGEM+ODC

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Kalman filter success rate for good π^- tracks



$$\text{Success rate} = N_{\text{success}}/N_{\text{good}}$$

Test with $\psi(3686) \rightarrow \pi^+\pi^- J/\psi \rightarrow \pi^+\pi^- e^+e^-$

Event selection flow	Boss665p01	Hough V14 (CgemBoss665f)	Hough v15 + Kal. Filter v15-9 (CgemBoss665f)	Hough v18 + Kal. Filter v15-12 (CgemBoss665f)
Ntrack \geq 4	75.89%	(69.81 \pm 0.46)%	(69.09 \pm 0.46)%	(73.15 \pm 0.99)%
$\pi^+ + \pi^- + e^+ + e^-$ selection ①	59.76%	(52.80 \pm 0.50)%	(53.55 \pm 0.50)%	(56.9 \pm 1.1)%
Loose J/ ψ mass cut ②	57.50%	(50.11 \pm 0.50)%	(50.86 \pm 0.50)%	(54.0 \pm 1.1)%
4C fit ($\chi^2 < 60$)	38.19%	(26.14 \pm 0.47)%	(32.08 \pm 0.47)%	(33.25 \pm 1.05)%

① $\pi^+ + \pi^- + e^+ + e^-$ selection: PID by momentum, $p < 0.8 \text{ GeV} \rightarrow \text{pion}$, $p > 0.8 \text{ GeV} \rightarrow \text{electron}$,
 $|dr| < 1.0 \text{ cm}$, $|dz| < 10 \text{ cm}$, $|\cos\theta| < 0.93$, total charge = 0

② Loose J/ ψ mass cut: m_{ee} in (2.5, 4.0) GeV/c^2 , $m_{\pi\pi\text{-recoil}}$ in (2.5, 4.5) GeV/c^2 , m_{total} in (3,5) GeV/c^2

- Hough v18 (+ DotsConnection-00-00-04, KalFitAlg-00-15-12) improved the final selection efficiency by $\sim 3.6\%$ compared with Hough v15
- But still lower than efficiency with MDC (BOSS665p01)