

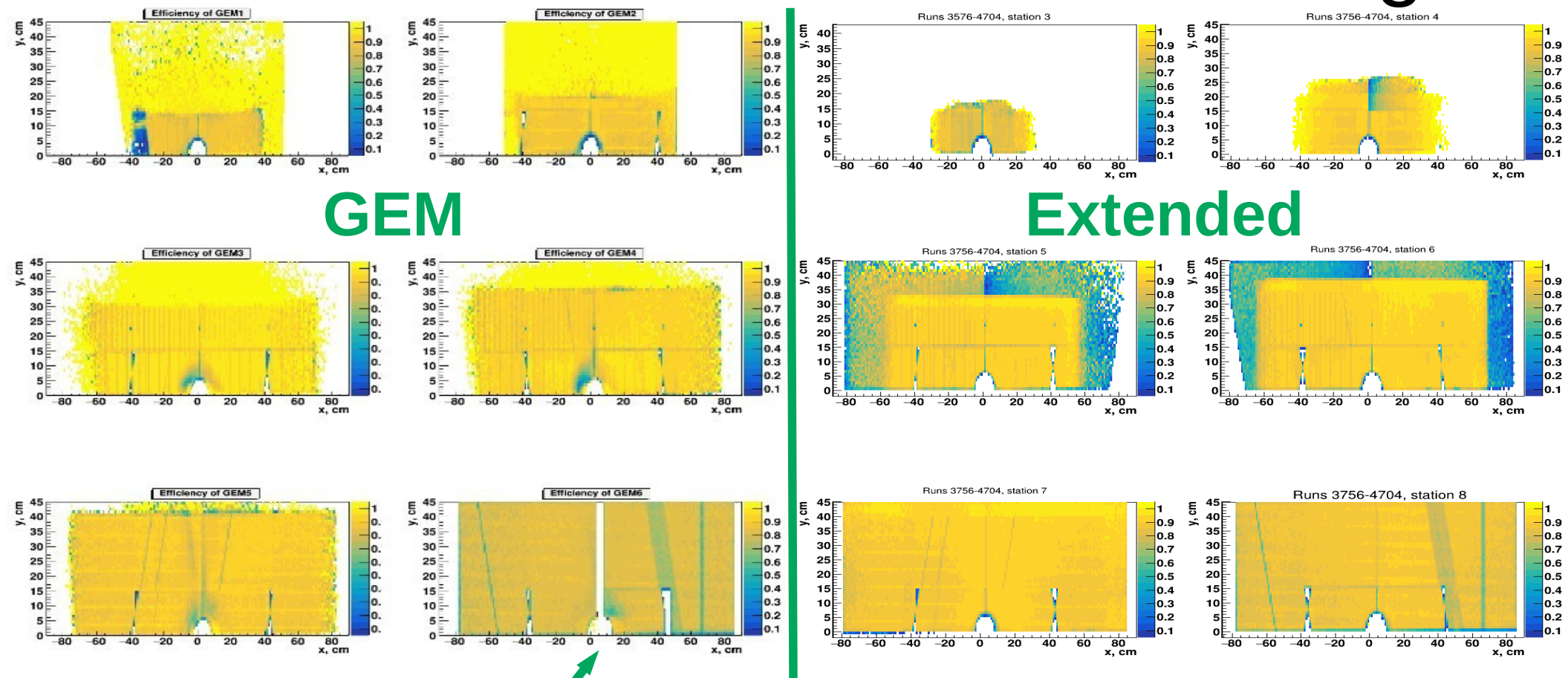
# Si/GEM efficiency

- Efficiency calculation algorithm
- Efficiency comparison for Extended and GEM tracking
- Si efficiency
- Si/GEM operation by runs
- Efficiency comparison for Data and MC

# Efficiency calculation algorithm

- $|\text{Event PV} - \text{estimated center of target}| < 6 \text{ cm}$
- $\text{PV nTracks} > 2$
- $\text{NHitsPerTrack} > 4$  (except a hit in the studied station)
- $|\text{Track}(Z_{\text{PV}}) - \text{PV}| < 2 \text{ cm}$
- Check for the acceptance

# Efficiency comparison for GEM and Extended tracking

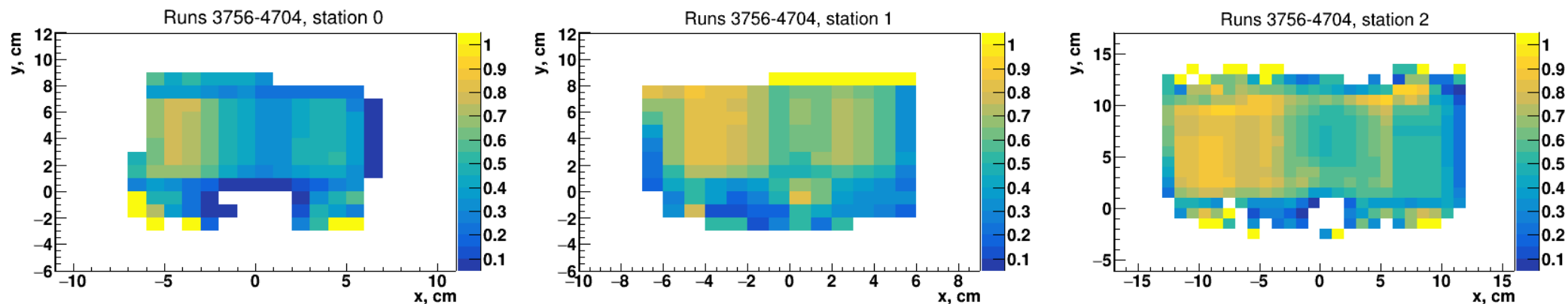


GEM

Extended

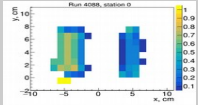
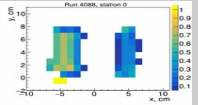
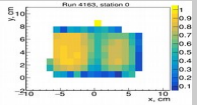
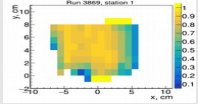
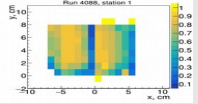
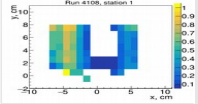
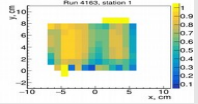
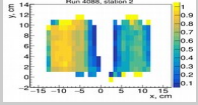
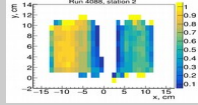
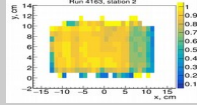
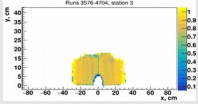
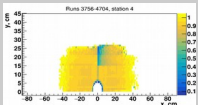
- Different results for outer area for GEM1-GEM4
- Common results for basic structure of GEMs (strips, High Voltage Net, hot/main zone edges etc.)
- Geo filter bug for GEM6 was fixed

# Si efficiency



- Si efficiency lower than GEM efficiency
- $X < 0$  region efficiency higher than for  $X > 0$  region for Si1-Si3

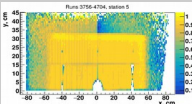
# Si/GEM operation by runs

Run \ Station	3756 - 3899	3900 - 3999	4000 - 4099	4100 - 4199	4200 - 4299	4300 - 4399	4400 - 4499	4500 - 4599	4600 - 4704
Si0	 <b>0.32</b>	<b>0.07</b>			 <b>0.61</b>				
Si1	 <b>0.14</b>	<b>0.07</b>	 <b>0.15</b>	 <b>0.02</b>	 <b>0.62</b>				
Si2	 <b>0.35</b>	<b>0.07</b>			 <b>0.58</b>				
GEM1						 <b>MAX<sub>eff</sub> ~0.83 (3756-3912), MIN<sub>eff</sub> ~0.71 (4159-4178)</b>			
GEM2						 <b>MAX<sub>eff</sub> ~0.88 (3756-3993), MIN<sub>eff</sub> ~0.87 (3994-4704)</b>			

# Si/GEM operation by runs

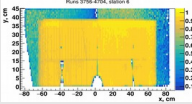
Run \ Station	3756 - 3899	3900 - 3999	4000 - 4099	4100 - 4199	4200 - 4299	4300 - 4399	4400 - 4499	4500 - 4599	4600 - 4704
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GEM3



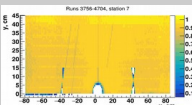
**MAX<sub>eff</sub> ~0.93 (3756-4141), MIN<sub>eff</sub> ~0.89 (4142-4704)**

GEM4



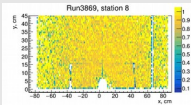
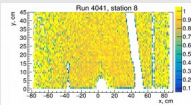
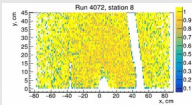
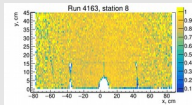
**MAX<sub>eff</sub> ~0.94 (3756-4157), MIN<sub>eff</sub> ~0.88 (4159-4178)**

GEM5



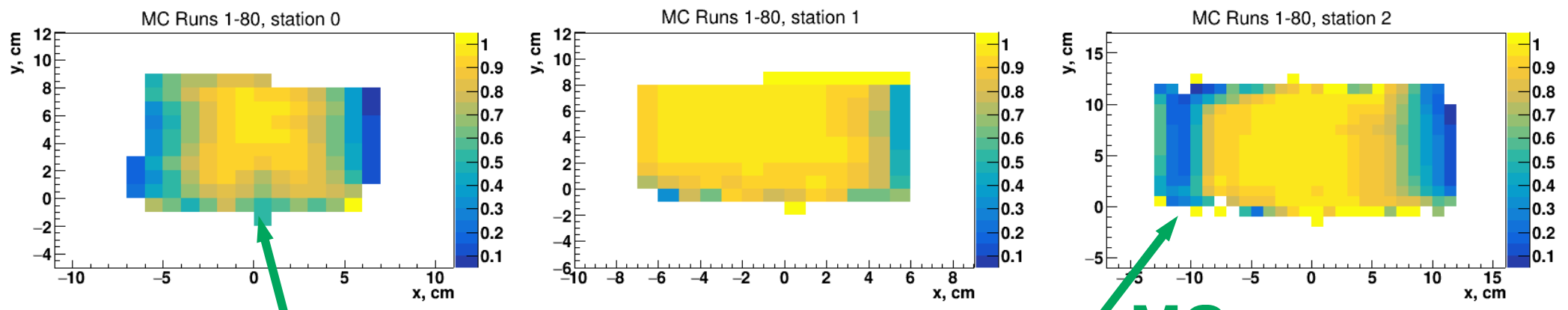
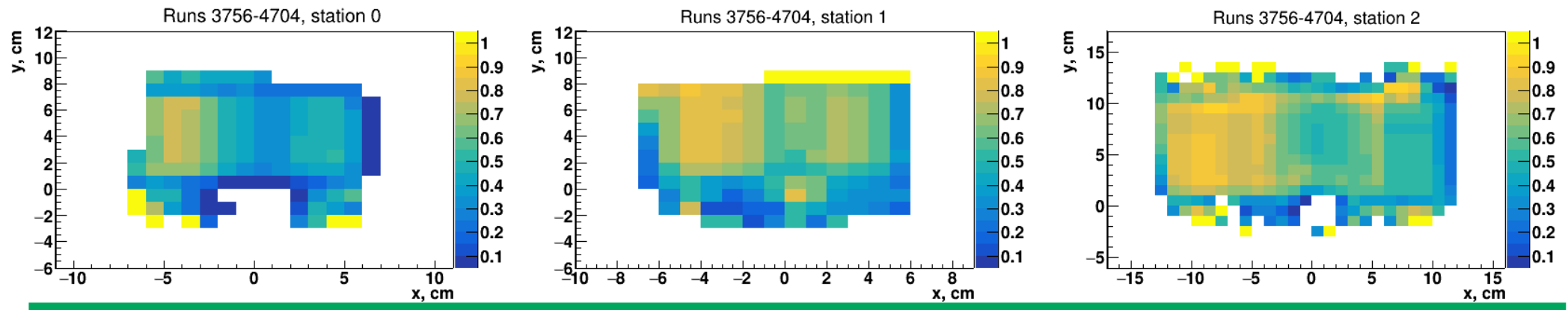
**MAX<sub>eff</sub> ~0.93 (3756-4157), MIN<sub>eff</sub> ~0.89 (4159-4231)**

GEM6

 <p><b>0.22, AVG<sub>eff</sub> ~0.88</b></p>	 <p><b>0.04, AVG<sub>eff</sub> ~ 0.83</b></p>	 <p><b>0.09, AVG<sub>eff</sub> ~ 0.84</b></p>	 <p><b>0.65, AVG<sub>eff</sub> ~0.85</b></p>
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# Efficiency comparison for Data and MC

Data

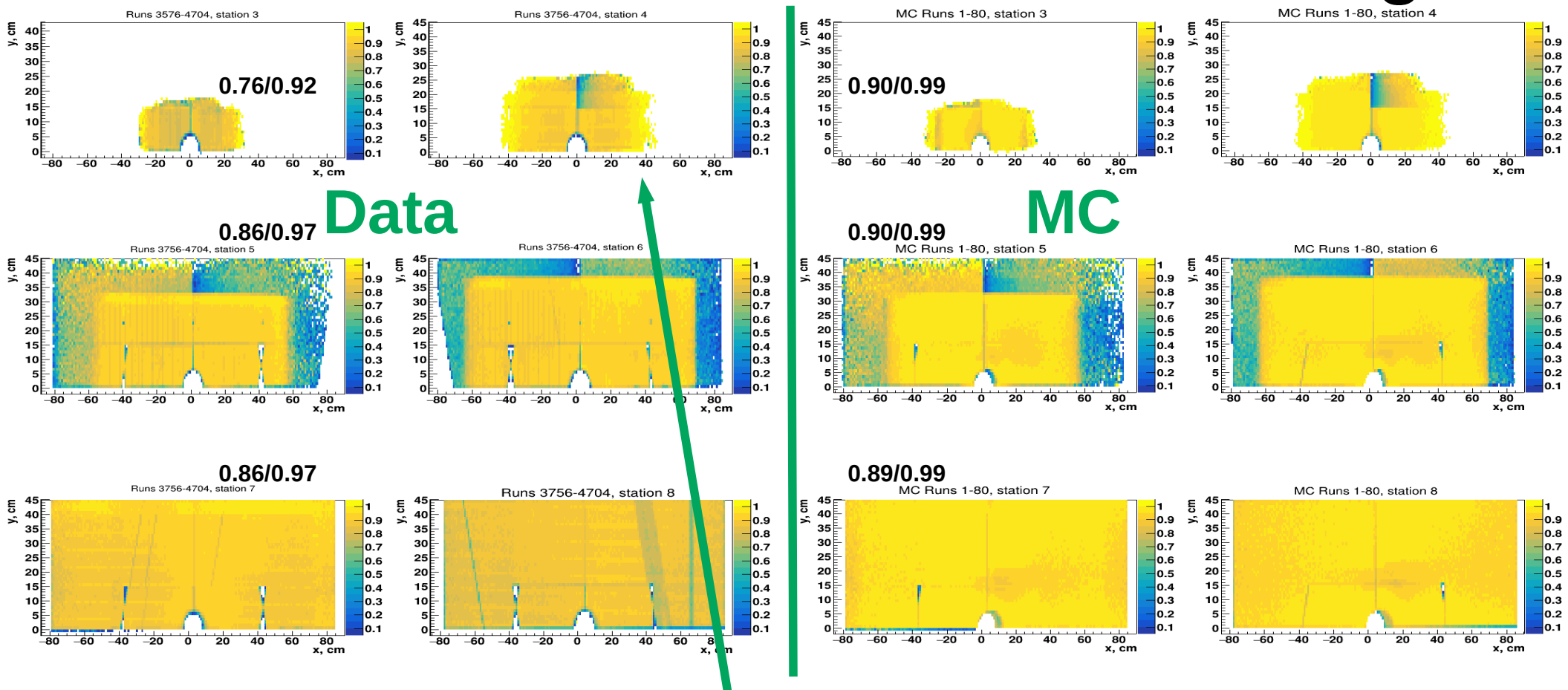


MC

- Extended tracking
- Low real Si efficiency
- No hole for Si1

- Strange low efficiency regions for MC Si3

# Efficiency comparison for GEM and Extended tracking



- Strange region for GEM2 (Data and MC)
- Regions with low and high efficiency for MC (possibly due to high hit density)
- $\text{Eff}_{\text{GEM1}} \sim 90\%$ ,  $\text{Eff}_{\text{GEM2-6}} \sim 95\%$



