

12/15/2023 GELATO Weekly

Max Cohen

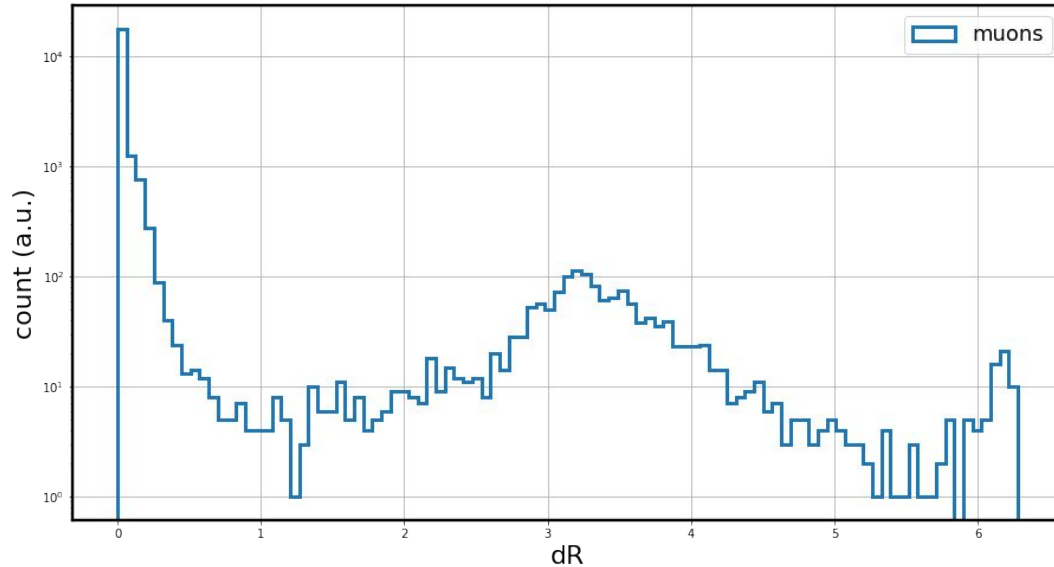


Duplicated Objects from LRT collections

	Pt	E	eta	phi
jet	524:			
	[[64.44489288	0.10565837	2.30946708	-0.65680104]
	[64.44489288	0.10565837	2.30946708	-0.65680104]
	[0.	0.	0.	0.]]]

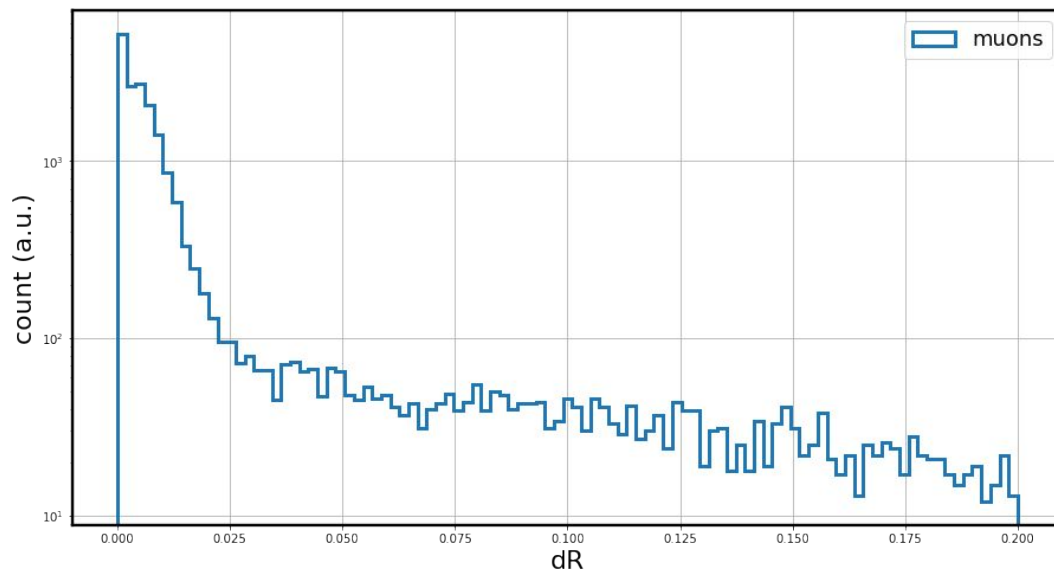
- Two of the same muon in this event, one coming from the LRT container

dR distribution



- Calculated between regular and LRT muons in same event

dR distribution



- Propose dR cut below 0.025

dR cut

no dR cut:

```
[[24.8159008  0.10565837 -0.60703707 -0.51028937]
 [24.77033043  0.10565837 -0.60715133 -0.510324  ]
 [ 0.          0.          0.          0.          ]]
```

with dR cut:

```
[[24.8159008  0.10565837 -0.60703707 -0.51028937]
 [ 0.          0.          0.          0.          ]
 [ 0.          0.          0.          0.          ]]
```

Example events

with/without dR cut:

no dR cut:

```
[[46.10725021  0.10565837  1.86471498  3.10784435]
 [41.44248199  0.10565837  1.8646704   3.10261917]
 [ 0.          0.          0.          0.          ]]
```

with dR cut:

```
[[46.10725021  0.10565837  1.86471498  3.10784435]
 [ 0.          0.          0.          0.          ]
 [ 0.          0.          0.          0.          ]]
```

dR cut

But sometimes we miss duplicated objects:

no dR cut:

```
[[4.56459814e+03 1.05658375e-01 1.92620730e+00 6.30996525e-02]  
[4.56459814e+03 1.05658375e-01 1.92620730e+00 6.30996525e-02]  
[0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00]]
```

with dR cut:

```
[[4.56459814e+03 1.05658375e-01 1.92620730e+00 6.30996525e-02]  
[4.56459814e+03 1.05658375e-01 1.92620730e+00 6.30996525e-02]  
[0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00]]
```

dR cut

- With a dR threshold of 0.025, we miss duplicated objects in 0.4% of events with an LRT object
- Are we accidentally removing non-duplicated objects?
 - Possibly, but this would require an LRT object being within $dR=0.025$ of a regular object in the same event
 - Should I measure how often this happens?