

Subject: Large momenta from BOX genarator

Posted by [AndreiSemenov](#) on Wed, 18 Nov 2020 14:52:14 GMT

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Hello,

I generate single muon events with 5 GeV momentum by the BOX generator. However I get events with very large momenta from detector, so for 100,000 initial muons there are 12 events with  $p > 100$  Gev and several events with  $p > 1000$  events. How is this possible, is something incorrect? PandaRoot Oct19 is used.

Data directly from signal\_pid.root file, 100,000 initial events.

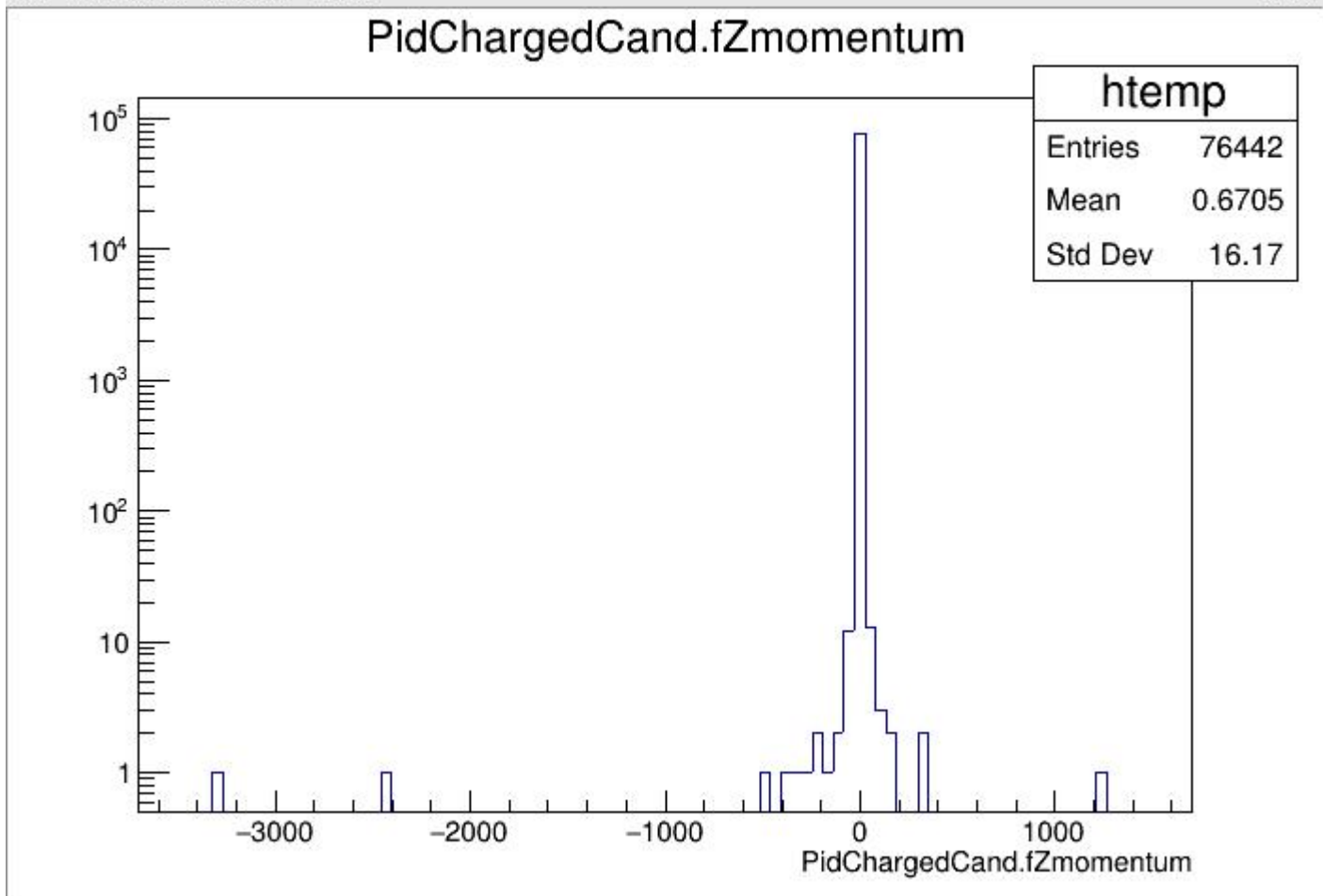
Data made by tut\_ana.C tutorial program. 1,700,000 initial events.

### File Attachments

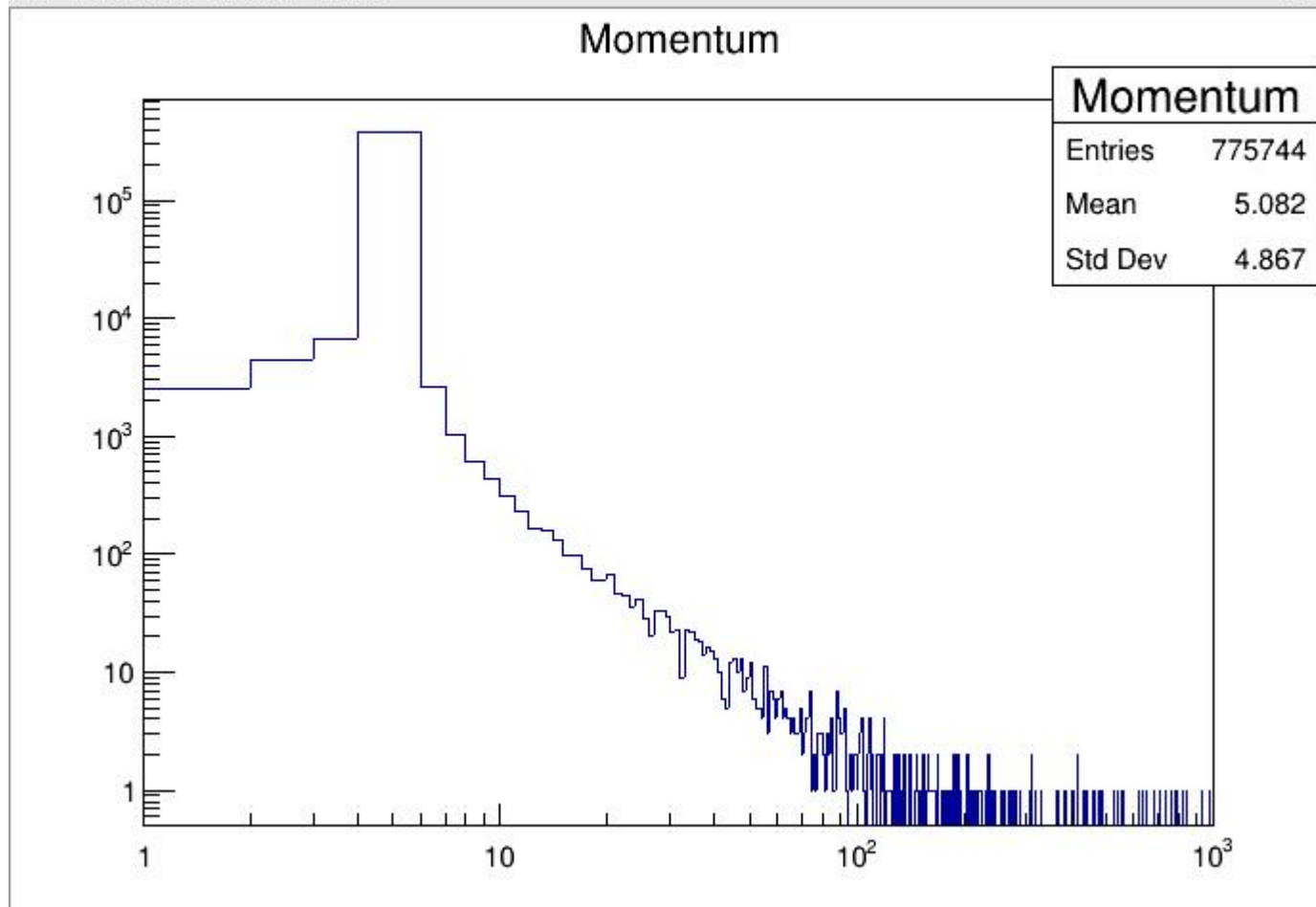
1) [zmom.jpeg](#), downloaded 1410 times

File Edit View Options Tools

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2) [mom.jpeg](#), downloaded 1421 times



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Subject: Re: Large momenta from BOX generator

Posted by [Tobias Stockmanns](#) on Wed, 18 Nov 2020 16:04:14 GMT

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Could you please check how the distribution looks like for primary particles?

Cheers,

Tobias

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Subject: Re: Large momenta from BOX generator

Posted by [AndreiSemenov](#) on Wed, 18 Nov 2020 18:31:12 GMT

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I use BOX generator as following:

TString inputGenerator =

"box:type(13,1)(5,5):phi(0,360):tht(5,175)";

(sorry some semicolon turn into smile)

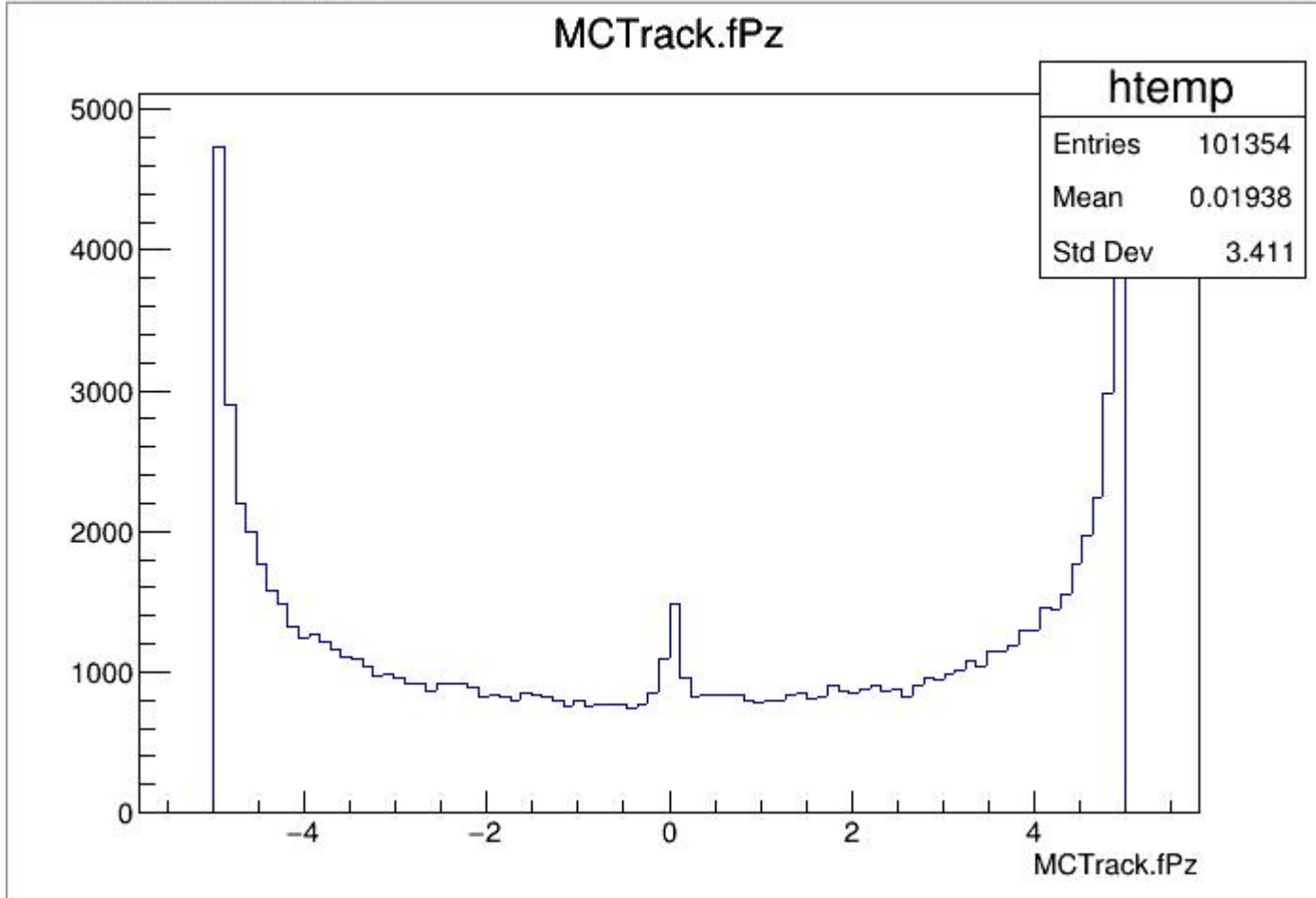
so I expect monochromatic muons in initial state. I hope following plot is relevant:

## File Attachments

1) [mcpz.jpeg](#), downloaded 1200 times

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Subject: Re: Large momenta from BOX generator

Posted by [Tobias Stockmanns](#) on Thu, 19 Nov 2020 06:18:02 GMT

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Dear Andrei,

could you please plot the start vertex (maybe in some projections) of the particles with momentum > 5 GeV/c and what type of particles they are?

Cheers,

Tobias

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Subject: Re: Large momenta from BOX generator  
Posted by [AndreiSemenov](#) on Mon, 23 Nov 2020 18:14:42 GMT  
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Hello,

Positions for particles with large momenta have relatively larger coordinates. Do not know how to draw them in a representative way.

I studied P3Cov() method of RhoCandidate that gives 3x3 covariance matrix of momentum vector. Estimating the std.dev. as square root of the sum of diagonal elements, it correlates with large momenta. The plot for correlation of this std.dev. and actual error for momentum of 5 GeV muon is attached, X is actual error and Y is std.dev. Most events have std.dev. 0.2 and actual error up to 0.5 GeV, but there are several events with std.dev. 0.2 and actual error 3 - 4 GeV, near 100% of actual value. Are there some ways of rejecting events with badly measured momenta?

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### File Attachments

1) [errors.jpeg](#), downloaded 1768 times

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