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Subject: Re: No back propagation to IP for V\_0 reconstruction

Posted by [donghee](#) on Wed, 03 Dec 2014 22:17:27 GMT

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Hi Stefano,

Option for back propagation are touched in both reco & pid macro as you suggested.

After track reconstruction,  $K_s$  mass distributions are compared, no PID applied and same statistics are simulated.

MC truth matched mass distributions are plotted to compare directly efficiency.

Red histo is for the propagation turns on,  $\text{eff}=0.407035$

Blue histo is for the propagation turns off,  $\text{eff}=0.403639$

Mass resolutions are completely different, no back propagation show much worsen resolution than back propagation case. This is easy to understand.

However the efficiency doesn't change.

A distance/ $(\gamma\beta)$  distributions for MC truth matched  $k_s$  are compiled to test V0 reconstruction, whether "no back propagation" show some improvement of tracking efficiency for V0 decay particle. Distance is defined as a length between  $k_s$  production and decay vertex.

Naively, I expected that efficiency should also increase with "no back propagation", since the decay particles produced far from IP can be reconstructed much better than "using back propagation". In middle range in normalized distance distribution, you can see a significant improvement of reconstruction efficiency for "no back propagation". But if  $k_s$  decay near the position of production vertex, the efficiency drop down drastically for "no back propagation" (see zoom plot at  $d/(\gamma\beta)$  below 1(cm)).

I don't know correctly why 0-1 region show a huge difference.

Best wishes,

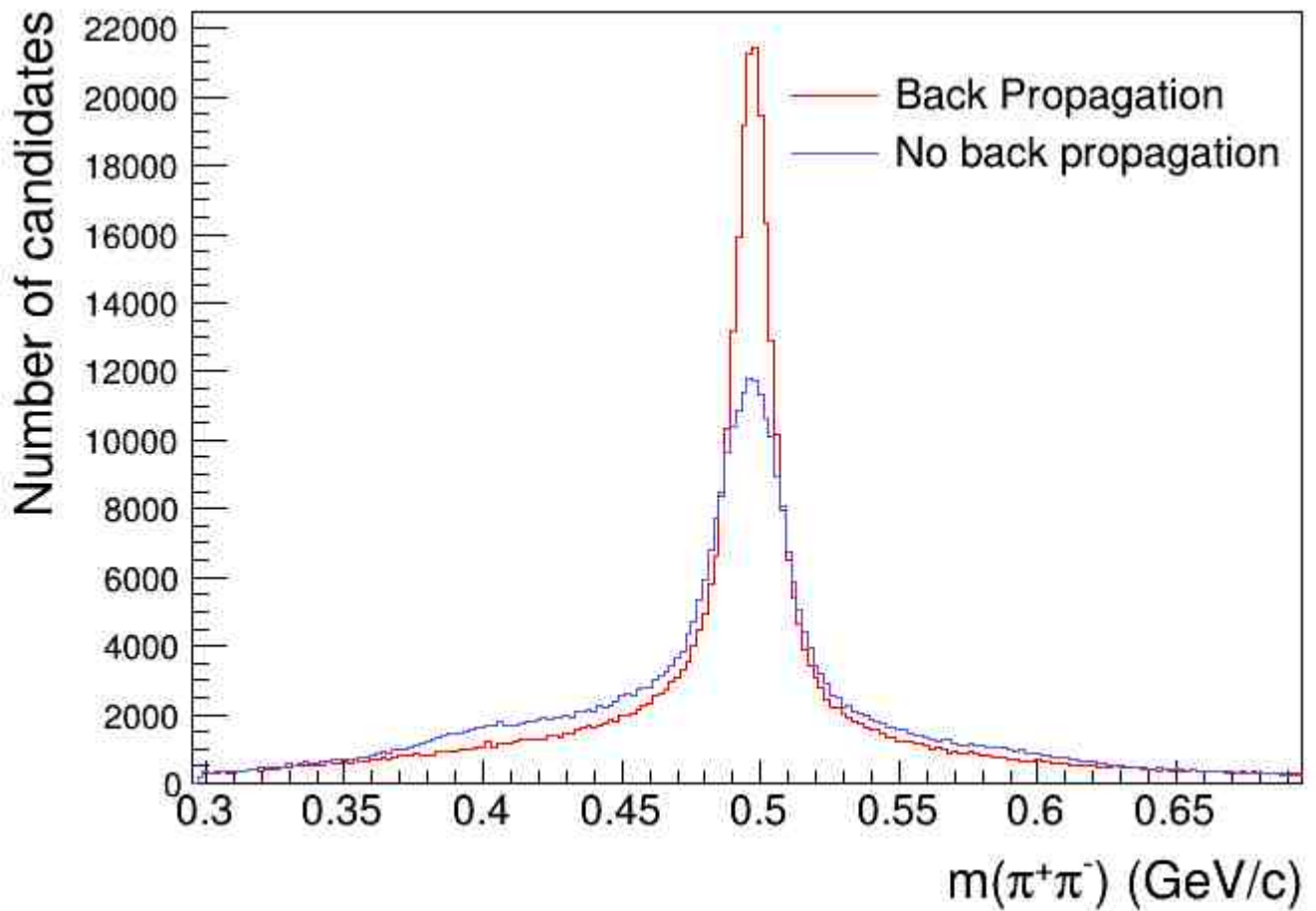
Donghee

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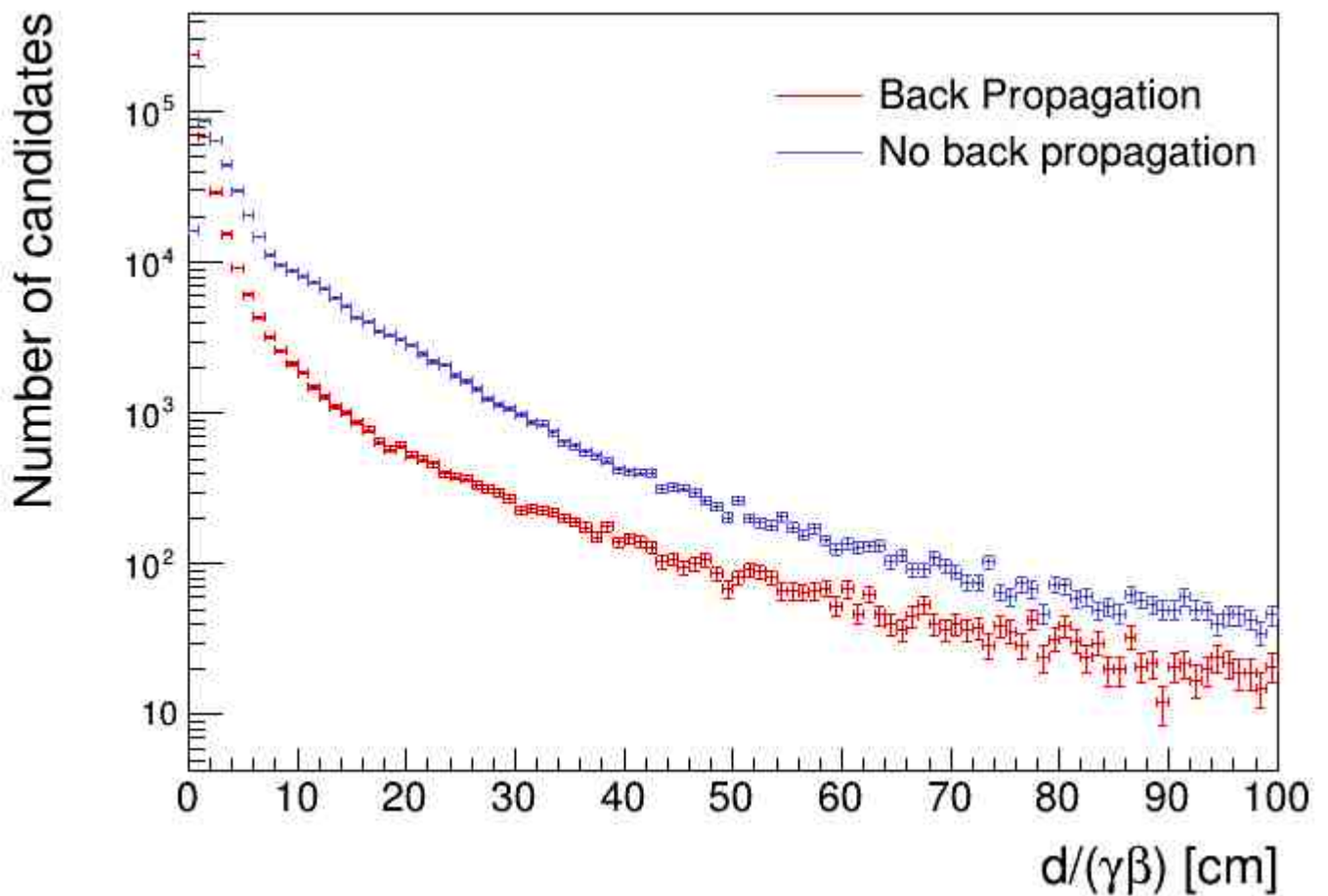
### File Attachments

1) [test\\_mass\\_d04.jpg](#), downloaded 629 times

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2) [test\\_ctau\\_d04.jpg](#), downloaded 545 times



3) [test\\_ctau\\_d04\\_zoom.jpg](#), downloaded 658 times

