

# PandaRoot Installation and Test

Ali, Haluk, Umut

Dear Haluk,

there is a wiki-page dedicated for help on installing and running PandaRoot. First you need an account for the wiki that you can apply for here:

<https://panda-wiki.gsi.de/foswiki/bin/view/System/UserRegistration?redirectto=/foswiki/bin/view/System/UserRegistration?;language=en>

Once logged in, you can find there information about PandaRoot (and sub-topics)

<https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRoot>

about the installation

<https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRootInstallGit>

and about using the analysis tools

<https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRootRhoTutorial>

In case of problems feel free to ask again.

Best regards,  
Klaus



**Tobias'tan PandaRoot  
için git account**

Dear Haluk,

I was on a conference last week and missed somehow your e-mail.  
The description of Klaus Götzen is fully right. In addition I will create an account for you on our gitlab server so that you can download PandaRoot and do developments for it.

Cheers,

Tobias

## PandaRoot

### ↓ PandaRoot

- ↓ Suggested version of the code
- ↓ Basics
- ↓ Advanced
- ↓ HOWTO's for running PandaRoot
- ↓ Structure of Code (Class Inheritance)
- ↓ Status of Code
- ↓ Reconstruction and Analysis
- ↓ Additional Information
- ↓ Meetings and Workshops
- ↓ Organisation
- ↓ The PANDA Computing Model
- ↓ Useful External Links on Coding and Debugging
- ↓ Obsolete

The simulation and reconstruction software framework for the Panda experiment at the FAIR accelerator at GSI.

- [Meeting minutes are here](#)

### Suggested version of the code

#### For ANALYSIS

- FairSoft [may16p1](#)
- FairRoot [v-17.10b](#)
- PandaRoot release [dec17p2](#)
- ROOT [version 6](#)
- (updated on 08/05/2018)

No virtual machine yet

#### For CODE DEVELOPMENT NEW

- FairSoft [oct17](#) or [dev](#)
- FairRoot [v-17.10b](#) or [dev](#)
- PandaRoot [dev](#)
- ROOT [version 6](#)
- (updated on 21/12/2017)



### Basics

- [Getting started with PandaRoot](#)
- [HOWTO install PandaRoot](#)
- [HOWTO install PandaRoot using git for developers](#)
- [HOWTO develop for PandaRoot with git](#)
- [HOWTO upgrade PandaRoot](#) **OBSOLETE**
- [HOWTO use git](#)
- [HOWTO use subversion](#) **OBSOLETE**
- [HOWTO work on code in the development repository and then check in code in svn from development to trunk](#) **OBSOLETE**
- [HOWTO implement time-based simulation](#)
- [FAQ: Troubleshooting PandaRoot Installation](#)
- [FAQ: Troubleshooting PandaRoot Running](#)
- [Useful PandaRoot Macros](#)
- [PandaRoot Coding Conventions](#)
- [PandaRoot Documentation Guidelines](#)

### Advanced

[https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRoot#Suggested\\_version\\_of\\_the\\_code](https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRoot#Suggested_version_of_the_code)

# PandaRoot installation guide

- PandaRoot installation guide
  - Requirements
  - Installing the external packages
  - Installing FairRoot
  - Installing PandaRoot
    - Using SVN
    - Using git for users (not developers)
    - Common for both git and svn users
  - Using PandaRoot
  - If you work on the GSI batch farm
  - Troubleshooting
    - In the installation of the externals I sent the configure.sh script but the terminal closed
    - My connection seems too slow, the download of the geant4 data files breaks with a timeout error
    - I am doing cmake of PandaRoot and it tells me the compilers used for FairSoft installation is different. What should I do?
    - My reco/pid macros are printing a lot of \* ERTRGO \* messages

## Requirements

- First check if your system possess all the requirements. The fundamental packages are cmake and git. Be sure to install them before starting the procedure. Once you will start the installation, if an important package is missing the system will detect it and print an error message, so that you can install it by yourself.
- If you use OS X, you need only to install gfortran and XQuartz. Check [here](#) to see from where to take the packages, not all the versions are good. A wrong gfortran version could give you troubles in the installation.

[https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRootInstallGit?validation\\_key=%253fa74e6627201ce2b623b5100f00352b06#Requirements](https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRootInstallGit?validation_key=%253fa74e6627201ce2b623b5100f00352b06#Requirements)

If you are on UBUNTU

```
sudo apt-get install cmake cmake-data g++ gcc gfortran \  
  debianutils build-essential make patch sed \  
  libx11-dev libxft-dev libxext-dev libxpm-dev libxmu-dev \  
  libglu1-mesa-dev libgl1-mesa-dev \  
  libncurses5-dev curl libcurl4-openssl-dev bzip2 libbz2-dev gzip unzip tar \  
  subversion git xutils-dev flex bison lsb-release python-dev \  
  libc6-dev-i386 libxml2-dev wget libssl-dev libkrb5-dev \  
  automake autoconf libtool
```

If you are on MacOS X

```
sudo port -v selfupdate // okulun firewall dan çıkamıyor. Evden bağlan yada telefon ile bağlanıp  
yap.
```

```
sudo port upgrade outdated
```

```
make install
```

```
// follow the web site https://panda-wiki.gsi.de/foswiki/bin/view/Computing/PandaRootInstallGit
git clone https://github.com/FairRootGroup/FairSoft fairsoft_may16p1
cd fairsoft_may16p1
git checkout -b may16p1 may16p1
./configure.sh
5 4 1 1 2 1 $HOME/programFiles/fairsoft_may16p1/buildFairSoft 2 // path doğru ver. Before
create a directory installFairSoft
```

```
/// OLMADIIIIIIIII diger versiyon deneniyor
```

```
// FAIRSOFTE installation
```

```
mkdir $HOME/programFiles/fairSoftware
cd $HOME/programFiles/fairSoftware
git clone https://github.com/FairRootGroup/FairSoft fairsoft_oct17
cd fairsoft_oct17
git fetch --tags
git checkout -b oct17 oct17
or
git clone -b oct17p1 https://github.com/FairRootGroup/FairSoft fairSoft_oct17p1
cd fairSoft_oct17p1
git branch

./configure.sh
5 4 1 1 2 1 $HOME/programFiles/fairSoftware/installFairSoft 2 // path doğru ver. Before create
a directory installFairSoft
```

```
// FAIRROOT installation
```

```
export SIMPATH=$HOME/programFiles/fairSoftware/installFairSoft
cd $HOME/programFiles/fairSoftware
git clone https://github.com/FairRootGroup/FairRoot.git FairRoot-v-17.10b
cd FairRoot-v-17.10b
git checkout -b v-17.10b v-17.10b
or
git clone -b v-17.10b https://github.com/FairRootGroup/FairRoot.git FairRoot-v-17.10b
cd FairRoot-v-17.10b
git branch

mkdir build
cd build

mkdir ../installFairRoot

cmake -DUSE_DIFFERENT_COMPILER=TRUE -DCMAKE_INSTALL_PREFIX=$HOME/
programFiles/fairSoftware/installFairRoot ../

make -j4

make install
```

```
// PANDAROOT installation
```

```
cd $HOME/programFiles/fairSoftware/installFairRoot/

export FAIRROOTPATH=$HOME/programFiles/fairSoftware/installFairRoot/
installFairRoot

cd $HOME/programFiles/fairSoftware
git clone https://pandaatfair.github.io/PandaRootGroup/PandaRoot.git ./PandaRoot-
dev
cd PandaRoot-dev/
git checkout -b develop
or
git clone -b dev https://pandaatfair.github.io/PandaRootGroup/PandaRoot.git ./
PandaRoot-dev
cd PandaRoot-dev/
git branch

username: haluk.denizli@cern.ch
passwd: Ecesu_2505

cd ../
mkdir installPanda-dev
cd installPanda-dev/
cmake -DUSE_DIFFERENT_COMPILER=TRUE ../PandaRoot-dev/
make -j4

cd $HOME/programFiles/fairSoftware/PandaRoot-dev/installPanda-dev

source ./config.sh

//. To check if panda root is ok

cd $HOME/programFiles/fairSoftware/PandaRoot-dev/macro/run

root -l sim_complete.C

root -l digi_complete.C

root -l reco_complete.C

root -l pid_complete.C

root -l ana_complete.C
```

### // FAIRSOF installation

```
mkdir $HOME/programFiles/fairSoftware  
cd $HOME/programFiles/fairSoftware  
— — git clone -b dev https://github.com/FairRootGroup/FairSoft FairSoftDev  
git clone -b jun19p2 https://github.com/FairRootGroup/FairSoft FairSoftSource
```

```
cd FairSoftSource  
git branch
```

```
mkdir $HOME/programFiles/fairSoftware/FairSoftInst  
./configure.sh  
5 4 1 1 2 1 $HOME/programFiles/fairSoftware/FairSoftInst // path doğru ver. Before create a  
directory FairSoftInst
```

### // FAIRROOT installation

```
export SIMPATH=$HOME/programFiles/fairSoftware/FairSoftInst; echo $SIMPATH  
cd $HOME/programFiles/fairSoftware  
mkdir FairRootInst
```

```
git clone -b v18.2.0 https://github.com/FairRootGroup/FairRoot.git FairRootSource  
cd FairRootSource  
git branch
```

```
mkdir build; cd build
```

```
cmake -DUSE_DIFFERENT_COMPILER=TRUE -DCMAKE_INSTALL_PREFIX=$HOME/  
programFiles/fairSoftware/FairRootInst ../
```

```
make; make install
```

### // PANDAROOT installation

```
cd $HOME/programFiles/fairSoftware
```

```
export FAIRROOTPATH=$HOME/programFiles/fairSoftware/FairRootInst ; echo  
$FAIRROOTPATH
```

```
git clone https://git.panda.gsi.de/PandaRootGroup/PandaRoot.git ./source  
cd PandaRootDev/  
git branch
```

```
username: haluk.denizli@cern.ch  
passwd: Ecesu_2505
```

```
mkdir buildPanda  
cd buildPanda/  
cmake -DUSE_DIFFERENT_COMPILER=TRUE ../  
make
```

```
cd $HOME/programFiles/fairSoftware/PandaRootDevInst/buildPanda/
```

```
source ./config.sh
```

```
//. To check if panda root is ok
```

```
cd $HOME/programFiles/fairSoftware/PandaRootDev/macro/run
```

```
root -l sim_complete.C
```

```
root -l digi_complete.C
```

```
root -l reco_complete.C
```

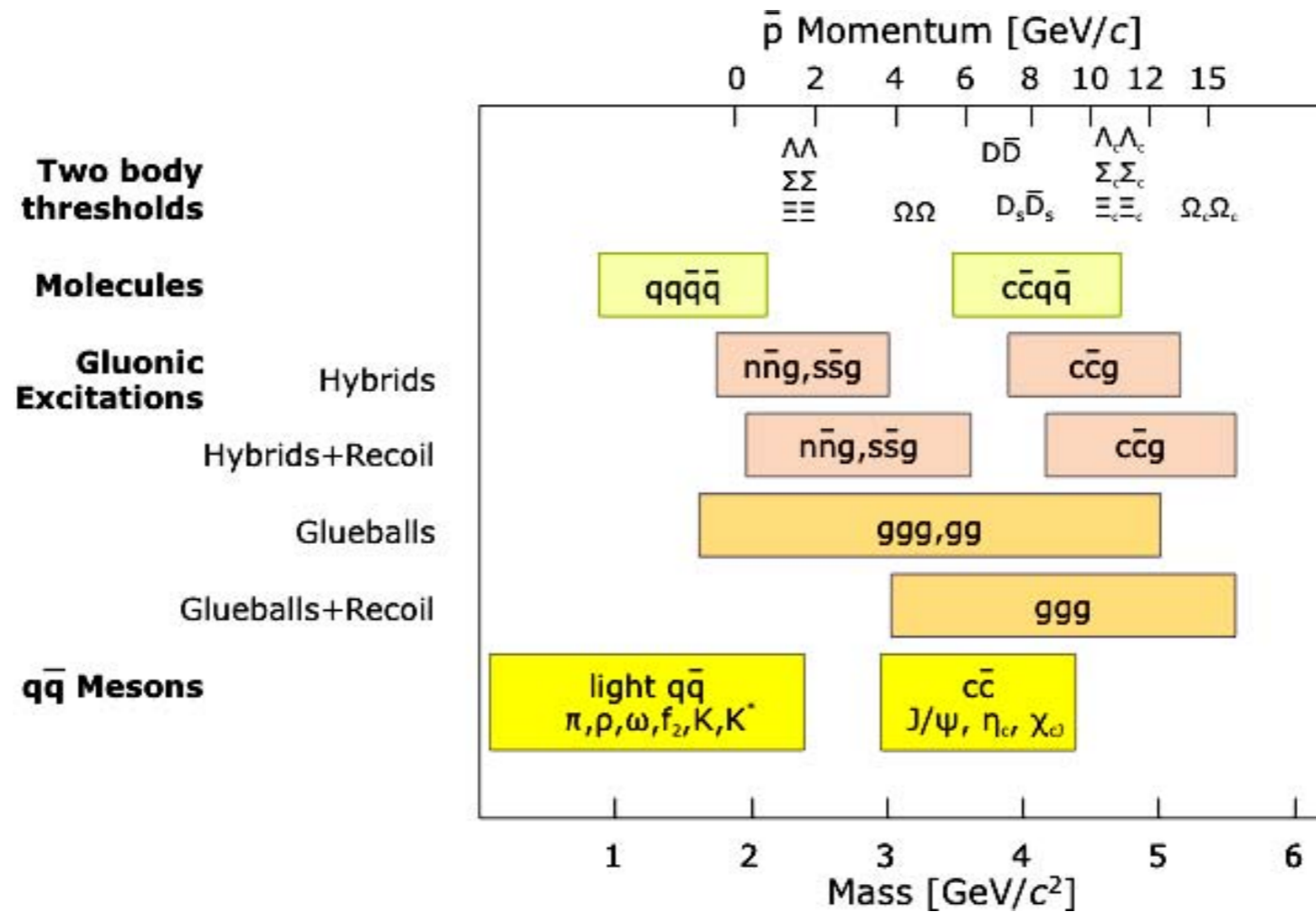
```
root -l pid_complete.C
```

```
root -l ana_complete.C
```

# PandaRoot Overview/Structure



Mass range of hadrons that will be accessible at PANDA. The upper scale indicates the corresponding antiproton momenta required in a fixed-target experiment. The HESR will provide 1.5 to 15 GeV/c antiprotons, which will allow charmonium spectroscopy, the search for charmed hybrids and glueballs, the production of D meson pairs and the production of baryon pairs for hypernuclear studies.





```
EvtInput+="/macro/run/psi2s_Jpsi2pi_Jpsi_mumu.dec";
```

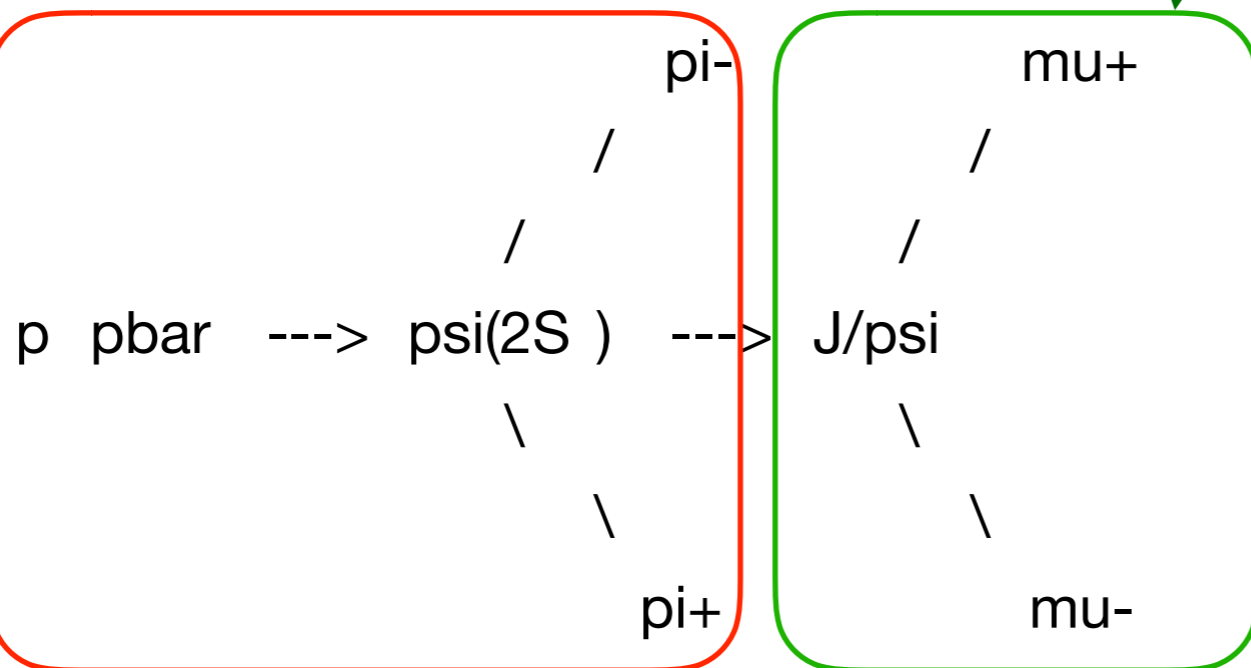
noPhotos

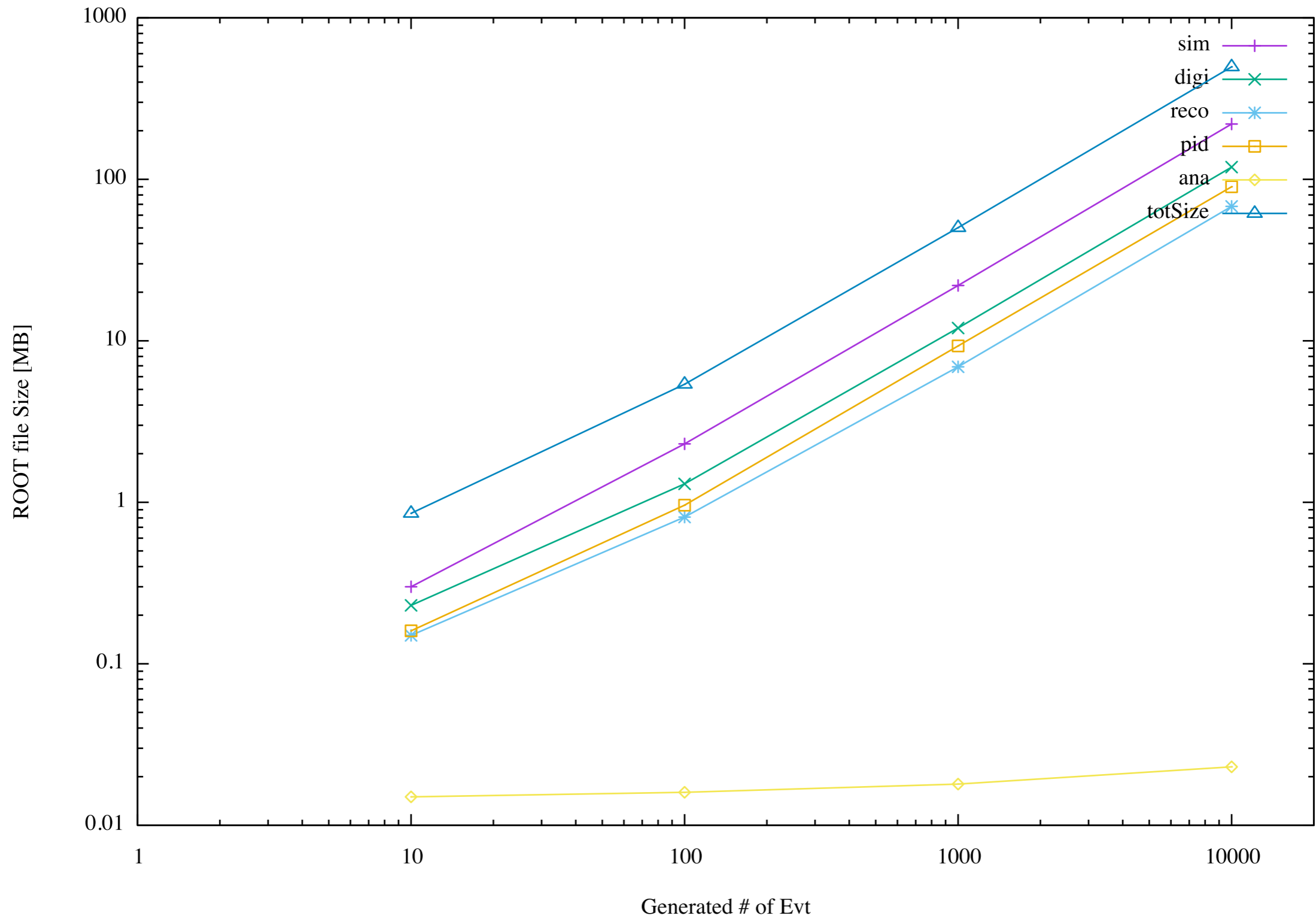
suppresses initial and final state radiation for simplicity

```
Decay pbarpSystem  
1.0 J/psi pi+ pi- PHSP;  
Enddecay
```

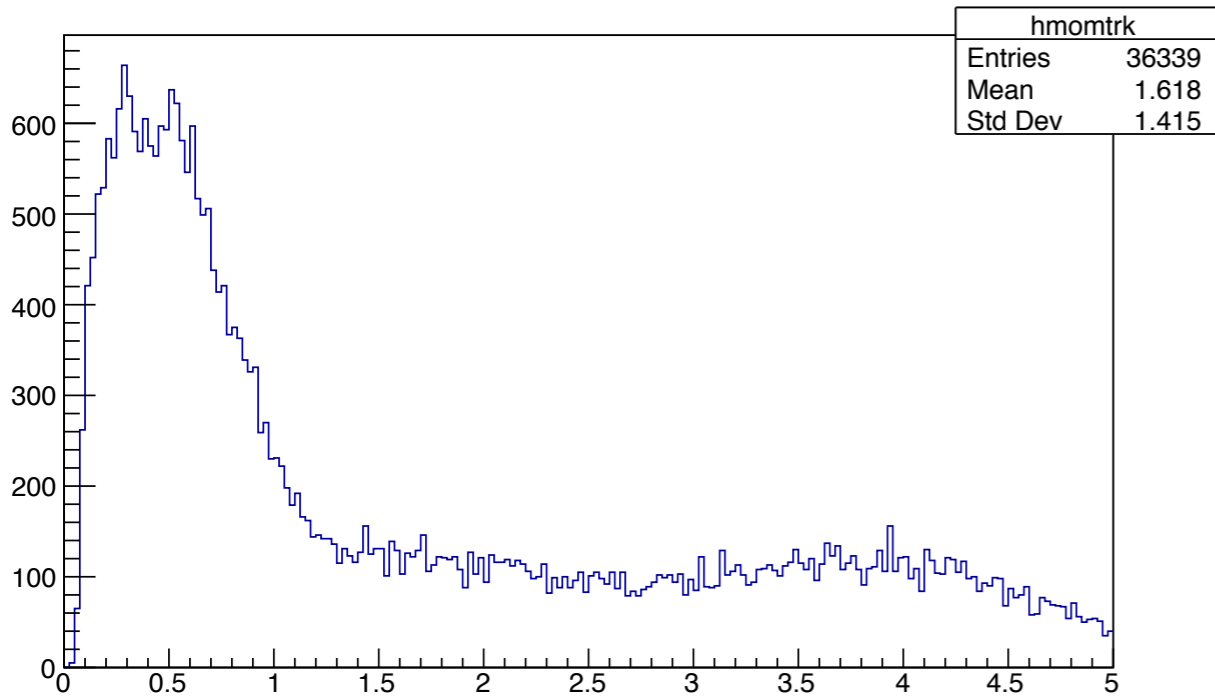
```
Decay J/psi  
1.0 mu+ mu- VLL;  
Enddecay
```

End

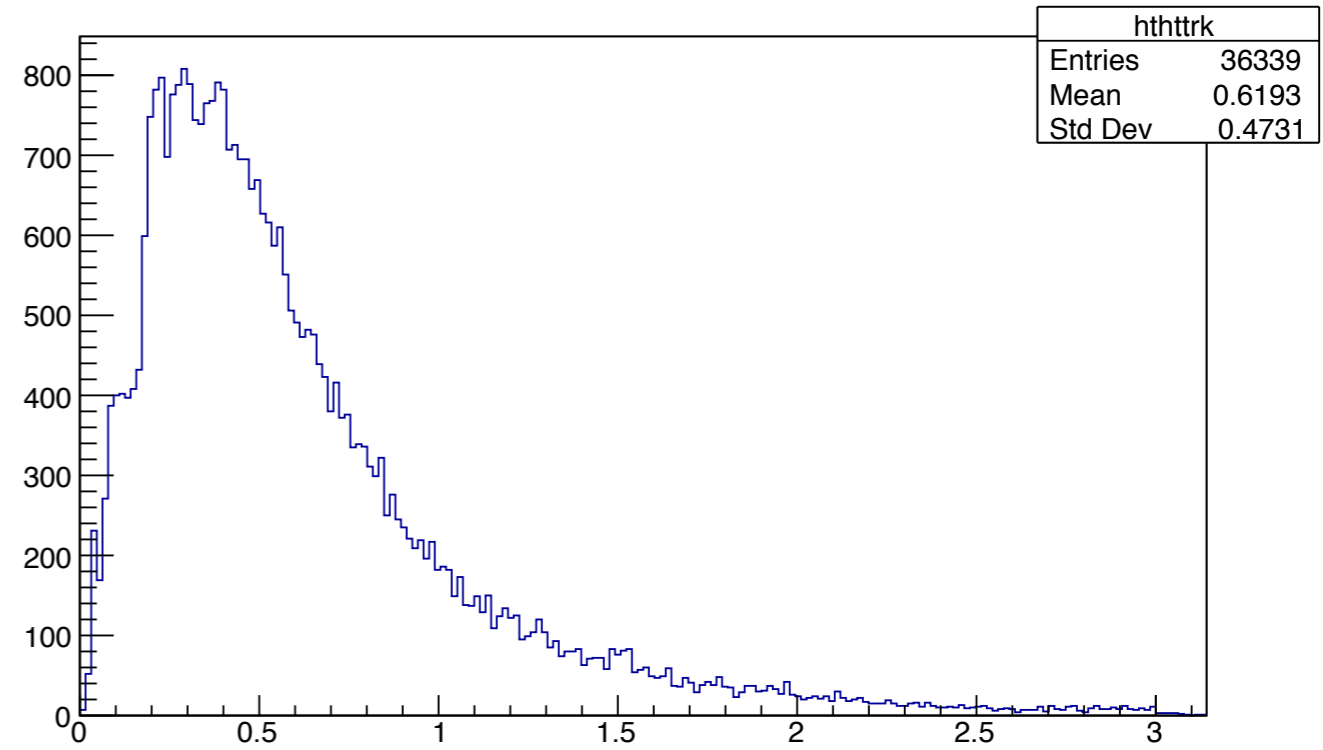
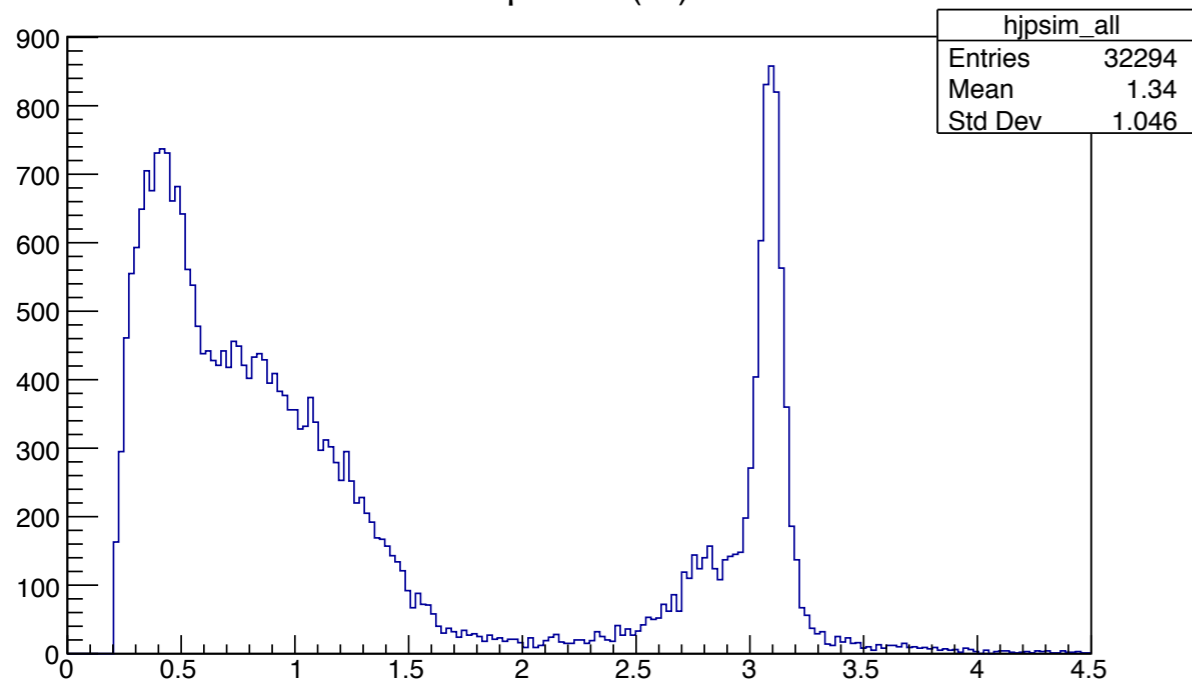
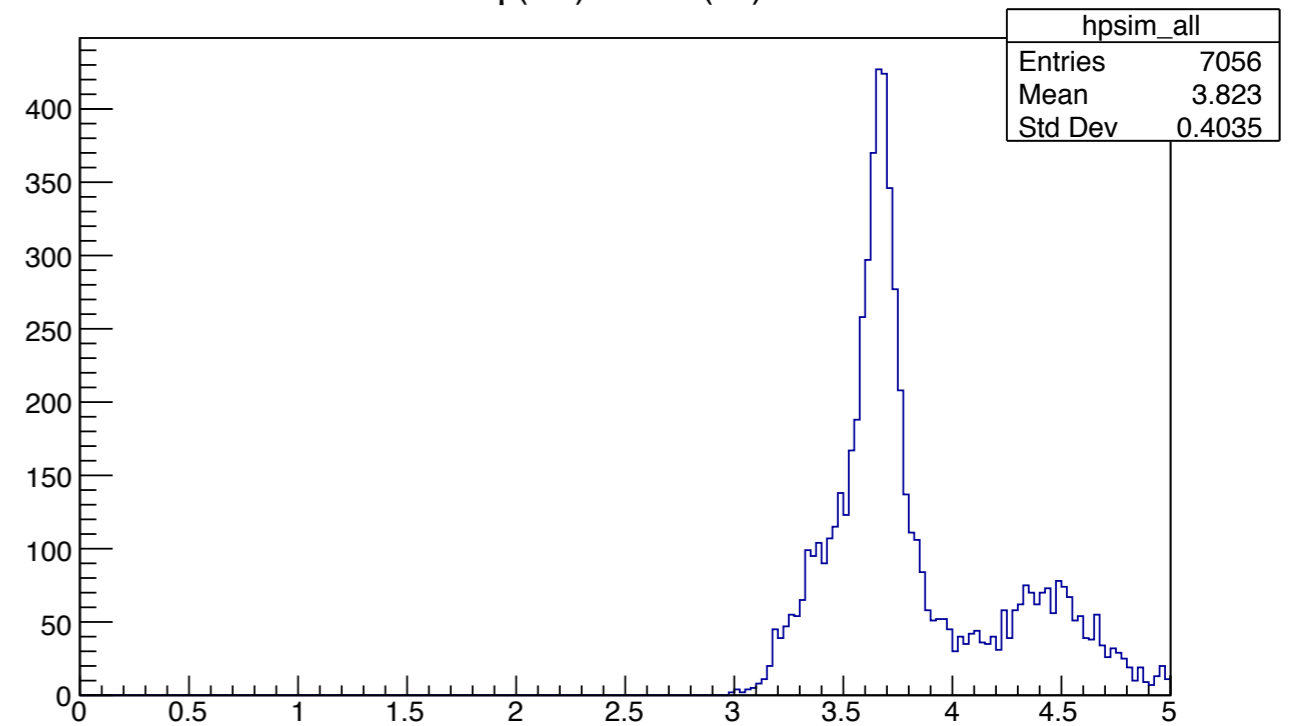




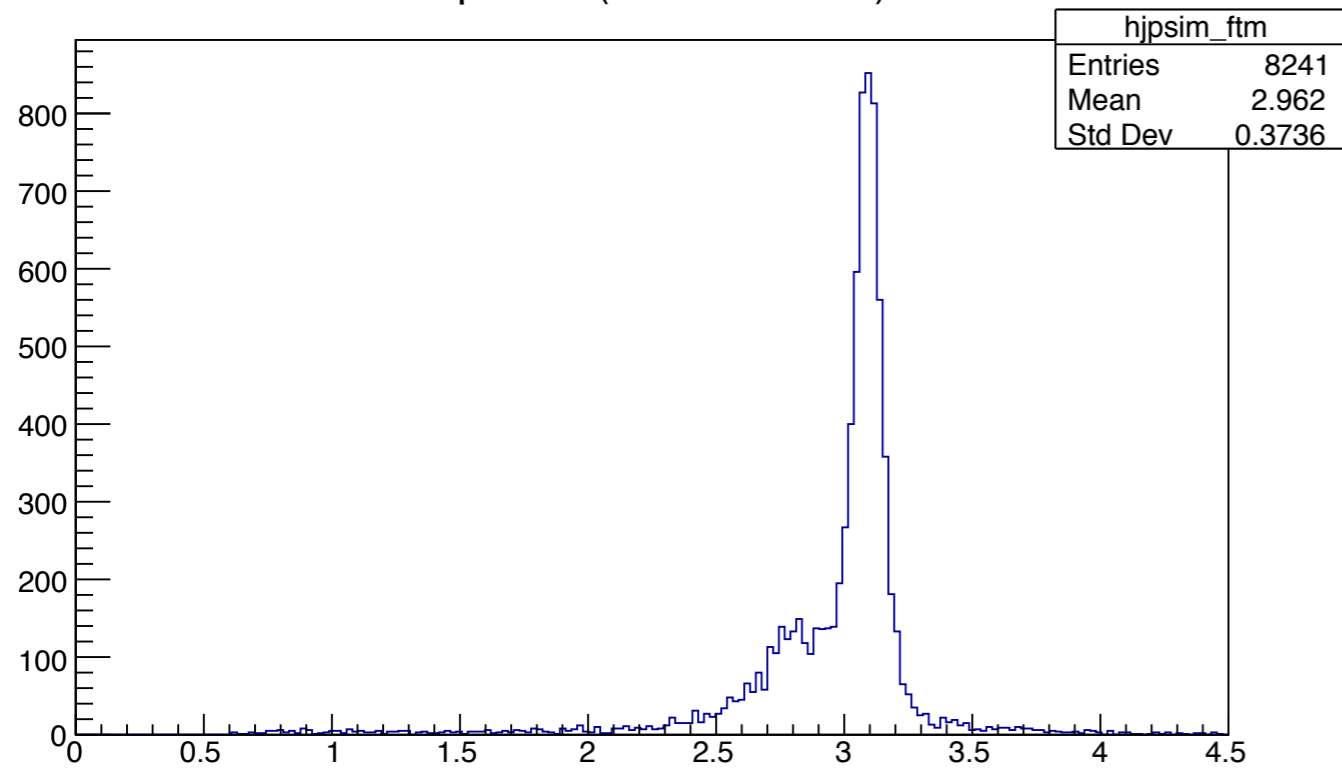
track momentum (all)



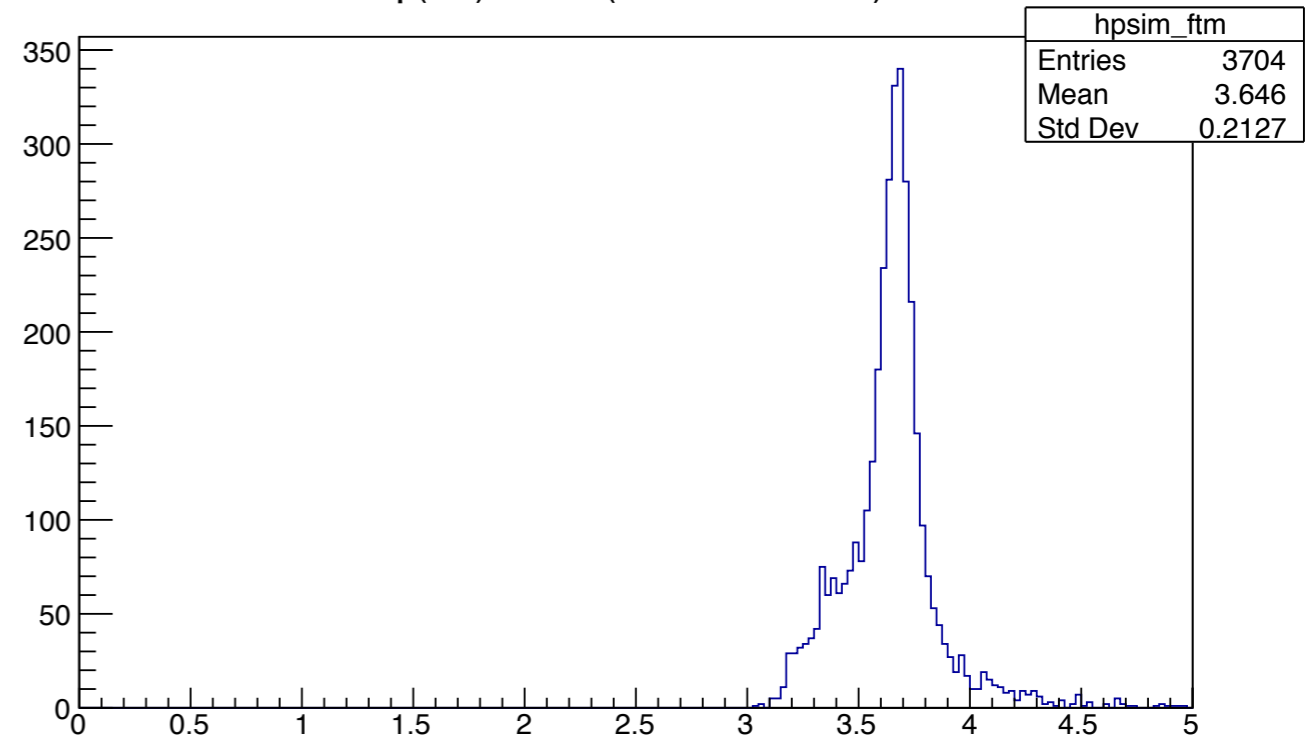
track theta (all)

J/ $\psi$  mass (all) $\psi(2S)$  mass (all)

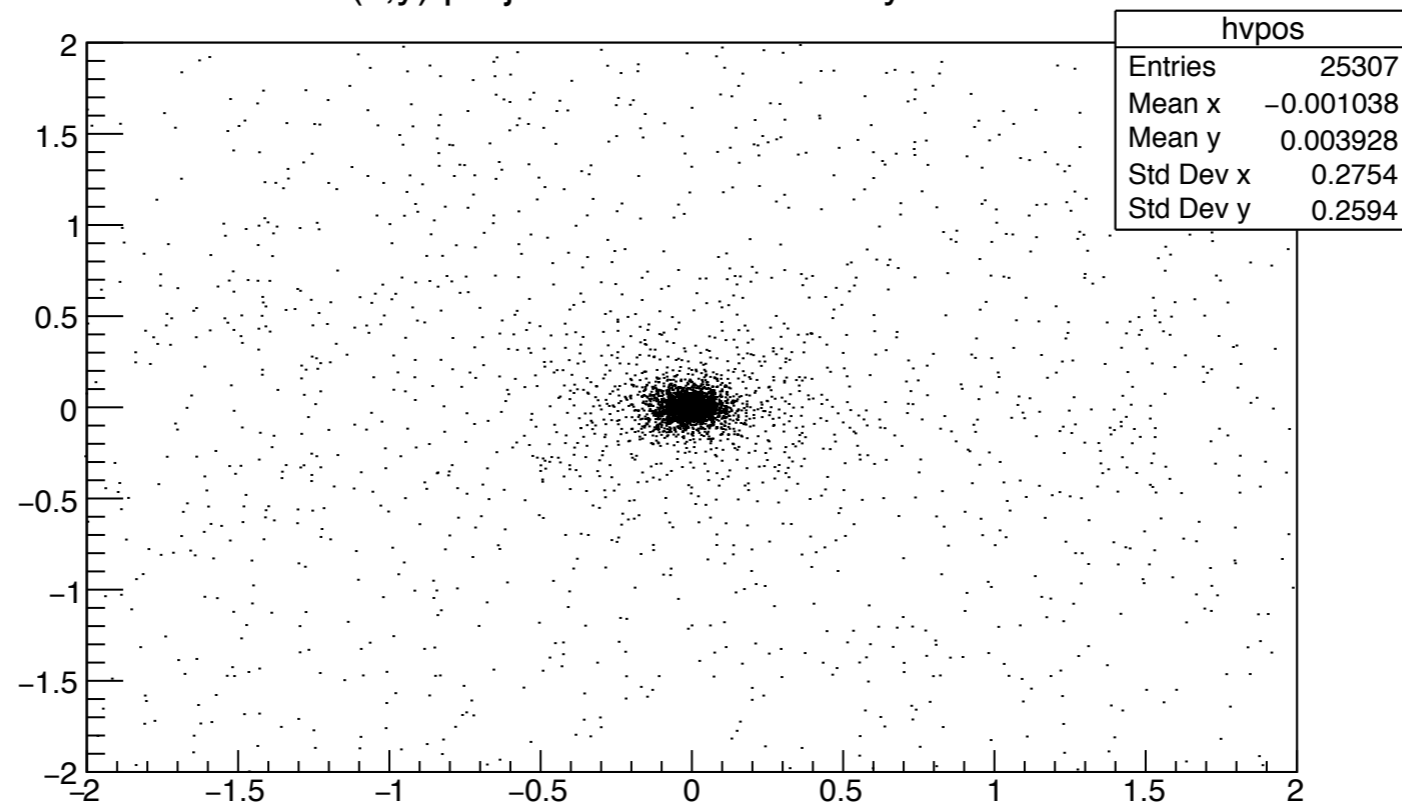
J/ $\psi$  mass (full truth match)



$\psi(2S)$  mass (full truth match)



(x,y) projection of fitted decay vertex



## PANDA Physics Analysis Activities (Status as of Jan. 2017)

## Open Charm Physics

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
psi' -> D+ D-, D+- -> K pi pi	reco quality of D+-	3.770 GeV	NN, for STT TDR	FZ Jülich	<a href="#">TDR</a>		completed	-	-	
pp -> DsJ(2317) Ds, DsJ(2317) -> Ds pi0	Width of state	4.268 GeV	<a href="#">Marius C. Mertens</a> , <a href="#">Elisabetta Prencipe</a>	FZ Jülich	<a href="#">Thesis</a>		in progress with full simulations	3	MED	Unique for PANDA
Ds -> e nu pi/eta/eta'	form factors, V_cd, V_cs	various	<a href="#">LuCao</a>	FZ Jülich	PhD Thesis		in progress	3	LOW	Complex
pp -> D+ D- (K pi pi), non-res.	x-sec of reactions	various	<a href="#">Andreas Hertel</a> , NN	FZ Jülich	PhD Thesis		to be followed up	1	HIGH	
ppbar-> D0 Dbar -> exclusive/inclusive	x-sec of reactions	various	<a href="#">Alexandros Apostolou</a>	KVI-CART	PhD Thesis		in progress	1	HIGH	
ppbar -> Lambda_c Lambda_c_bar -> Lambda pi0 pi+ ...	x-sec of reactions	various	<a href="#">Solmaz Vejdani</a>	KVI-CART	PhD Thesis		in progress	2,3	LOW	
ppbar -> D0(->gg/mu+mu-gamma) D0bar	new physics	6.596 GeV/c	<a href="#">Donghee Kang</a>	Mainz	Internal report		completed	3	-	

## Charmonium

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pp -> chi_c1,2 (gam) -> J/psi (->ll) gam (gam)	angular distribution	3.510 - >3.566 GeV	NN		<a href="#">PhysBook</a>		fastsim finished (Elisa Fioravanti), needs update		MED	
pp->h_c->5 pions	width of state, cross section	3.525 GeV	NN				fastsim finished (Anastasia Karavdina), needs update		MED	
pp->h_c->eta_c gamma	width of state	3.525 GeV	NN				<a href="#">PhysBook</a> finished (Dima Melnychuk), needs update		MED	
pp->psi(1^3D_2)	mass and width of state, spin parity	3.822 GeV	Zhiqing Liu	JGU Mainz	<a href="https://panda.gsi.de/system/files/user_uploads/liuz%40uni-mainz.de/RN-QCD-2015-005.pdf">https://panda.gsi.de/system/files/user_uploads/liuz%40uni-mainz.de/RN-QCD-2015-005.pdf</a>		in progress			

## Charmonium-like Exotics

X(3872) -> J/psi rho	width of state	3.872 GeV	<a href="#">Tsitohaina Randriamalala</a>	FZ Jülich	<a href="#">Thesis</a>		done			
X(3872) -> J/psi pi+ pi-	width of state	3.872 GeV	<a href="#">Martin Galuska</a>	U Gießen			done			
X(3872) -> J/psi pi+ pi- / D0 D0b	line shape, structure of state	3.872 GeV	<a href="#">Tobias Weber</a>	HI Mainz			done			
pp -> Y(4260) -> J/psi (->ll) pi+ pi-	angular dist., decay model	4.260 GeV	<a href="#">Elisa Fioravanti</a>	INFN Ferrara	<a href="#">PhysBook</a>		done			
X(3872)->J/psi pi+ pi-	mass, width, line shape	3.872 GeV	Klaus Goetzen et al.	GSI Darmstadt	<a href="https://panda.gsi.de/system/files/user_uploads/k.goetzen/RN-QCD-2016-002.pdf">https://panda.gsi.de/system/files/user_uploads/k.goetzen/RN-QCD-2016-002.pdf</a>		released	1	HIGH	Success will depend on actually cross section
pp -> Y(4260, 4350, 4660,...) -> J/psi (->ll) pi+ pi- or J/psi (->ll) pi0 pi0	Y(4260, 4350, 4660,...) -> DD'bar and their possible combinations as D* D'bar or D D*'bar		Mikhail Barabanov et al.	JINR Dubna			in progress			
charmonium-like exotics			Mikhail Barabanov et al.	JINR Dubna			planned			
pp -> X(3872) -> chi_c1 pi+ pi-	search for Z(3730) -> chi_c1 pi+	3.872 GeV	Ludovico Bianchi	FZ Juelich			in progress			
pd -> Z_c p	Z_c on deuteron target		Alexander Blinov	Dubna			in progress			

## Light Mesons and Exotics

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pbar p -> phi 3pi, phi 4pi	hybrid candidate X(2175)	3.75 <a href="#">GeV</a> /c	NN				not assigned (fastsim finished; Ch. Motzko)	1	MED	
pbar p -> phi phi energy scan	broad tensor states (PWA)	1.5 to 2 <a href="#">GeV</a> /c	NN				not assigned	1	HIGH	
pbar p -> phi phi pi0	glueball production / PWA	3.75 and 15 <a href="#">GeV</a> /c	NN				not assigned (fastsim finished, M. Albrecht)	1	MED	
pbar p -> K K pi0	glueball production / PWA	3.75 and 15 <a href="#">GeV</a> /c	NN				not assigned (fastsim finished, T. Schroeder)	1	MED	
pbar p -> K K pi0 pi0	glueball production / PWA	3.75 and 15 <a href="#">GeV</a> /c	NN				not assigned	1	LOW	
pbar p -> 4pi	a1(1420) in pbar p / PWA	1.64 <a href="#">GeV</a> /c	NN				not assigned	1	MED	

## Baryons

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pp -> Lambda Lambdabar	feasibility	1.642, 1.918, 6.0 GeV/c	Simone Esch	FZ Jülich	PhD Thesis		completed	1		
pp -> Lambda Lambdabar	feasibility	4.4, 7.7 GeV/c	<a href="#">Jacek Biernat</a>	U Cracow			completed	1		
pp -> Lam_c+ Lam_c_bar-; Lam_c+ -> Lambda pi+	feasibility	various	Dariusch Deermann	FZ Jülich	PhD Thesis		completed	2,3		
pp -> Y Yb	feasibility, polarization	various	<a href="#">Stanislav Belostotski</a> + NN	PNPI			<span>open</span>	1	HIGH	
pp -> Xibar+ Lambda K-	Xi(1690)	4.2 GeV/c	Andre Goerres	FZ Jülich	PhD Thesis		completed	1		
pp -> Xi- Xibar+	Xi spec. / PID	3.75 GeV/c	Christian Hammann	U Bonn	CM LIX Computing		completed	1		
pp -> Xibar+ Lambda K-	Xi(1820) & Xi(1690)	4.6 GeV/c	<a href="#">Jenny Pütz</a>	FZ Jülich			<span>in progress</span>	1	HIGH	unique for PANDA
pp -> Xi- Xibar+ eta	Xi spec.	various p > 4.6 GeV/c	<a href="#">Xinying Song</a>	FZ Jülich			<span>in progress</span>	1	HIGH	unique for PANDA
pp -> Xi- Xibar+ pi0	Xi spec.	various p > 3.5 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich			<span>in progress</span>	1	HIGH	unique for PANDA
pp -> Xi- Xibar+ pi+ pi-	Xi spec.	various p > 3.6 GeV/c	<a href="#">Alessandra Lai</a>	FZ Jülich			<span>assigned</span>	1	HIGH	unique for PANDA
pp -> Xi- Xibar+ pi0 pi0	Xi spec.	various p > 3.6 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich			<span>assigned</span>	1	HIGH	unique for PANDA

## Hyperon Dynamics

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pp -> Xi- Xib+	tracking, spin observables	<a href="#">4 GeV</a> and <a href="#">7 GeV</a>	Walter Andersson Ikegami	Uppsala			memo in progress	1	High	Unique for PANDA
pp -> Lambda Lambdabar	tracking, spin observables	<a href="#">1.64 GeV</a> , <a href="#">4 GeV</a> , <a href="#">7 GeV</a>	Walter Ikegami-Andersson	Uppsala			memo in progress	1	High	Below <a href="#">~2 GeV</a> : Possibility to verify using LEAR data Above <a href="#">4 GeV</a> : Unique for PANDA
pp -> Omega Omega_bar	spin observables	<a href="#">7 GeV</a>	Walter Ikegami-Andersson, Karin Schönning	Uppsala			<span>assigned</span>	1-2	Med	Unique for PANDA
pp -> Sigma Sigmabar	spin observables	<a href="#">4 GeV</a>	NN				<span>assigned</span>	1	Low	Above <a href="#">4 GeV</a> : Unique for PANDA
pp -> Sigmabar0 Lambda	Sigma0 Dalitz decay	<a href="#">4 GeV</a>	Gabriela Perez Andrade	Uppsala			assigned	2	Med	Unique for PANDA

## Antiproton Nucleus Collisions

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pbar + 40Ca -> Y Yb X	antihyperons in nuclei; GiBUU Event Generator	p = 4.07 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich	<a href="#">Note</a>		done	1		
pbar + 40Ca -> J/psi X	J/psi production inside nuclei	p = 4.07 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich			done	3		
pbar d -> phi pi- p_spec	test of spectator model	p = 4.0 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich			done	1 - 3		spectator model in EvtGen is working
pbar d -> (pi- pi-) (p pi+)	Delta Delta component	p = 8 - 15 GeV/c	<a href="#">Albrecht Gillitzer</a>	FZ Jülich			<span>in progress</span>	1	HIGH	unique access; pbar+d background generator needed
pbar + 20Ne -> Lambda Lamdabar X	Anti-Lambda nuclear potential	E_kin = 1 GeV	NN	U Mainz			<span>assigned</span>	1	HIGH	unique access
pbarA -> pi+pi-X, K+K-X, pbarpX	nuclear CT	~8 GeV/c	<a href="#">Kamal Dutta</a>	U Gaihati			<span>in progress</span>	1	Med-High	complementary to p and e- induced studies
pbarA -> pions + X, pbar p + X	nuclear SRC	~8 GeV/c	NN				<span>open</span>	1	Med-High	complementary to p and e- induced studies

## Electromagnetic Processes

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pp -> e+ e-	Feasibility: proton Form Factors	various: p=[1.7-13.4] <a href="#">GeV/c</a>	M. Sudol et al.	Mainz/Orsay	Eur. Phys. J. A 44, 373–384 (2010)		done with <a href="#">BaBar</a> framework	1	MED	Simulations with <a href="#">BaBar</a> framework
pp -> e+ e-	Feasibility: proton Form Factors	various: p=[1.7-6.4] <a href="#">GeV/c</a>	Khaneft, Dbeyssi, Tomasi-Gustafsson	Mainz/Orsay/Saclay	Eur.Phys.J. A52 (2016) no.10, 325		done	1	MED	Simulations with PANDAROOT
pp -> mu+ mu-	Feasibility: proton Form Factors	various: p=[1.5-3.3] <a href="#">GeV/c</a>	I. Zimmermann	Mainz	PANDA Release Note		mature	1	MED	Process is unique for PANDA
pp -> gamma* pi0 -> e+ e- pi0	Feasibility: FFs (unphysical region)	p=1.7 <a href="#">GeV/c</a>	J. Boucher	Orsay/Mainz	<a href="#">PhD</a> Thesis		done with <a href="#">BaBar</a> framework	1	HIGH	Simulations with <a href="#">BaBar</a> Framework
pp -> gamma* pi0 -> e+ e- pi0	Feasibility: TDAs	s= 5 and 10 <a href="#">GeV2</a>	M. Zambrana, M.C. Mora Espi	Mainz	Eur.Phys.J. A51 (2015) no.8, 107		done	3	MED	Process is unique for PANDA
pp -> J/psi pi0 -> e+ e- pi0	Feasibility: TDAs	s=12.3, 16.9, 24.3 <a href="#">GeV2</a>	E. Atomssa	Orsay	arXiv:1610.02149		done	3	MED	Process is unique for PANDA
pp -> gamma gamma	Feasibility for GDAs	s=6.25,12.25, 16.0 and 30.25 <a href="#">GeV2</a>	NN		previously assigned to Giessen G.	arXiv:0903.3905	not assigned	1	MED	
pp -> pi0 gamma	Feasibility for GDAs	s=6.25,12.25, 16.0 and 30.25 <a href="#">GeV2</a>	NN		previously assigned to Giessen G.	arXiv:0903.3905	not assigned	1	HIGH	Process is unique for PANDA

## Drell-Yan

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
p p->mu+ mu- X	cross section, angular distribution, {azimuthal asymmetries}	various, starting from highest	Skachkova Anna	JINR Dubna	PANDA Physics Book Phys.Part.Nucl.Lett. 6 (2009) 309-319 arXiv:hep-ph/0506139v2 Czech.J.Phys.55:A75-A92,2005 Eur. Phys. J. A 49 (2013) 42 Physics of Particles and Nuclei 44 (2013) 886 EPJ Web of Conferences 73 (2014) 02012		done	1,2,3	MED	

## Miscellaneous

Channel(s)	Measurement	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
pbar p elastic	Re/Im of x-sec	various	Qiang Hu	FZ Jülich	PhD Thesis		assigned			
pp -> pi+ pi- / pi+ pi- pi+	performance tracking	various	Elisa Fioravanti	INFN Ferrara	<a href="#">STT TDR</a>		done			
pp -> pi+ pi-	bkg/trigger studies	various	Ong, Van de Wiele	Orsay	<a href="#">IPNO-DR-08-01</a>		done			
pp -> multi hadron	hadron prod., generator	various	Kuraev, Tomasi	Orsay	Phys.Rev.D81 (2010) 017501		done			
pp -> mu+ mu- X , e+ e- X , J/psi X	Performance MUO	E_beam = 14 <a href="#">GeV</a>	Anna Skachkova	Dubna	<a href="#">Muon TDR</a> arXiv:hep-ph/0506139v2 J.Phys.Conf.Ser. 503(2014)012016 J.Phys.Conf.Ser. 426 (2013) 012031		done			
pp -> gam X , 2gam X	structure fun., kt-effect	various	Anna Skachkova	Dubna	PANDA CM Phys.Part.Nucl.Lett. 12(2015) no.6, 763-772		assigned		low	

## Technical

Topic	sqrt(s)/Beam momentum	Analyzer	Institute	Reference	Wiki link	Status	Phase	Priority	Comment
EMC as rapid prefilter	various	Ronald Kunne	Orsay	PANDA CM 12/12		assigned			
Particle ID based on Bayes approach	various	M. Gumberidze, R. Kunne	Orsay	PANDA CMs		assigned			
Associate Bremsstrahlung with electrons	various	Ma, Hennino, Ramstein	Orsay	PANDA CMs		assigned			

-- KlausGoetzen - 15 Feb 2013

-- PaolaGianotti - 25 Sep 2014

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Topic revision: r41 - 09 Mar 2018, KarinSchoenning

<https://panda-wiki.gsi.de/foswiki/bin/view/PhysicsCmt/PhysicsAnalysisActivities>