

B- $\rightarrow$ DK, D- $\rightarrow$ KK $\pi\pi$ , binned fit

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# Chapter 1

## Class Index

### 1.1 Class List

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## Chapter 2

# File Index

### 2.1 File List

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## Chapter 3

# Class Documentation

### 3.1 Amplitude Class Reference

```
#include <Amplitude.h>
```

#### Public Member Functions

- [Amplitude](#) (const std::string &Damplitude, const std::string &DBARamplitude)
- std::complex< double > [operator\(\)](#) (const std::vector< double > &event, int conj)

#### 3.1.1 Detailed Description

[Amplitude](#) is a class that loads the shared libraries generated by AmpGen and calculates the amplitude of events  
Definition at line 13 of file Amplitude.h.

#### 3.1.2 Constructor & Destructor Documentation

##### 3.1.2.1 Amplitude()

```
Amplitude::Amplitude (
    const std::string & Damplitude,
    const std::string & DBARamplitude )
```

Constructor that loads the shared library for D and Dbar decay amplitudes  
Definition at line 10 of file Amplitude.cpp.

#### 3.1.3 Member Function Documentation

##### 3.1.3.1 operator()()

```
std::complex< double > Amplitude::operator() (
    const std::vector< double > & event,
    int conj )
```

Overload () operator to easily access amplitude

**Parameters**

<i>event</i>	Vector of four-momenta of event
<i>conj</i>	Set to +1 for $D^0$ decay and -1 for $\overline{D}^0$ decay

Definition at line 17 of file Amplitude.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/Amplitude.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/Amplitude.cpp](#)

## 3.2 Bin Class Reference

```
#include <Bin.h>
```

### Public Member Functions

- [Bin](#) ()
- void [AddEvent](#) ([Event](#) event, int charge)
- int [GetNumberEvents](#) (int charge) const
- [EventList](#) [GetEvents](#) (int charge)

### 3.2.1 Detailed Description

[Bin](#) is a class for a bin in phase space

Definition at line 11 of file Bin.h.

### 3.2.2 Constructor & Destructor Documentation

#### 3.2.2.1 Bin()

```
Bin::Bin ( )
```

Default constructor that creates an empty [EventList](#)

Definition at line 7 of file Bin.cpp.

### 3.2.3 Member Function Documentation

#### 3.2.3.1 AddEvent()

```
void Bin::AddEvent (
    Event event,
    int charge )
```

Function for adding an event

## Parameters

<i>event</i>	<a href="#">Event</a> to add
<i>charge</i>	+1 for B+, -1 for B-

Definition at line 10 of file Bin.cpp.

### 3.2.3.2 GetEvents()

```
EventList Bin::GetEvents (
    int charge )
```

Function for betting [EventList](#) object

## Parameters

<i>charge</i>	+1 for B+, -1 for B-
---------------	----------------------

## Returns

eventlist [EventList](#) object

Definition at line 27 of file Bin.cpp.

### 3.2.3.3 GetNumberEvents()

```
int Bin::GetNumberEvents (
    int charge ) const
```

Function for getting number of events in this bin

## Parameters

<i>charge</i>	+1 for B+, -1 for B-
---------------	----------------------

## Returns

Number of events in this bin

Definition at line 18 of file Bin.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/Bin.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/Bin.cpp](#)

### 3.3 BinList Class Reference

```
#include <BinList.h>
```

#### Public Member Functions

- [BinList](#) ([PhaseSpaceParameterisation](#) php)
- void [AddEvent](#) ([Event](#) event, int charge)
- void [AddEvent](#) ([Event](#) event, int charge, int maxevents)
- void [LoadTTree](#) (TTree \*tree, int charge)
- int [NumberBins](#) ()
- std::vector< int > [GetEvents](#) (int charge) const
- [Bin GetBin](#) (int i)
- void [Predict](#) (const [DDecayParameters](#) &ddparameters, const [CPPParameters](#) &cppparameters, std::vector< double > &BplusEvents, std::vector< double > &BminusEvents, int totalBplus, int totalBminus)

#### 3.3.1 Detailed Description

[BinList](#) is a class that contains all the bins in phase space [BinList](#) also loads the input data and puts it in their respective bins

Definition at line 17 of file [BinList.h](#).

#### 3.3.2 Constructor & Destructor Documentation

##### 3.3.2.1 BinList()

```
BinList::BinList (
    PhaseSpaceParameterisation php )
```

Constructor that takes a [PhaseSpaceParameterisation](#) object and creates the bins

##### Parameters

<i>php</i>	A <a href="#">PhaseSpaceParameterisation</a> object that defines the bins in the 5D phase space
------------	---

Definition at line 14 of file [BinList.cpp](#).

#### 3.3.3 Member Function Documentation

### 3.3.3.1 AddEvent() [1/2]

```
void BinList::AddEvent (
    Event event,
    int charge )
```

Function for adding an event to the correct bin

#### Parameters

<i>event</i>	Event object to be added to the correct bin
<i>charge</i>	+1 for B+, -1 for B-

Definition at line 17 of file BinList.cpp.

### 3.3.3.2 AddEvent() [2/2]

```
void BinList::AddEvent (
    Event event,
    int charge,
    int maxevents )
```

Function for adding an event to the correct bin, if the number of events in that bin is less than the maximum

#### Parameters

<i>event</i>	Event object to be added to the correct bin
<i>charge</i>	+1 for B+, -1 for B-
<i>maxEvents</i>	Maximum number of events in each bin

Definition at line 21 of file BinList.cpp.

### 3.3.3.3 GetBin()

```
Bin BinList::GetBin (
    int i )
```

Function for getting Bin object

#### Parameters

<i>i</i>	Bin number
----------	------------

**Returns**

[Bin](#) object

Definition at line 65 of file BinList.cpp.

**3.3.3.4 GetEvents()**

```
std::vector< int > BinList::GetEvents (
    int charge ) const
```

Function for getting the number of events in each bin

**Parameters**

<i>charge</i>	+1 for B+, -1 for B-
---------------	----------------------

**Returns**

A vector of the number of events in each bin

Definition at line 57 of file BinList.cpp.

**3.3.3.5 LoadTTree()**

```
void BinList::LoadTTree (
    TTree * tree,
    int charge )
```

Function for loading events from input data into their respective bins

**Parameters**

<i>tree</i>	A ROOT TTree in the AmpGen format containing all the input data events
<i>charge</i>	+1 for B+, -1 for B-

Definition at line 28 of file BinList.cpp.

**3.3.3.6 NumberBins()**

```
int BinList::NumberBins ( )
```

Function for getting number of bins

Definition at line 53 of file BinList.cpp.



### 3.3.3.7 Predict()

```
void BinList::Predict (
    const DDecayParameters & ddparameters,
    const CParameters & cpparameters,
    std::vector< double > & BplusEvents,
    std::vector< double > & BminusEvents,
    int totalBplus,
    int totalBminus )
```

Function for calculating the number of events in each bin, given the D decay parameters and the CP parameters

#### Parameters

<i>ddparameters</i>	A <a href="#">DDecayParameters</a> object that describes the D meson decay
<i>cpparameters</i>	A <a href="#">CParameters</a> object that describes the CP violation in the B meson decay
<i>BplusEvents</i>	Vector of predicted number of B+ events
<i>BminusEvents</i>	Vector of predicted number of B- events
<i>totalBplus</i>	Total number of B+ events
<i>totalBminus</i>	Total number of B- events

Definition at line 69 of file BinList.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/BinList.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/BinList.cpp](#)

## 3.4 CParameters Class Reference

```
#include <CParameters.h>
```

### Public Member Functions

- [CParameters](#) (double xplus, double xminus, double yplus, double yminus)
- void [GetCParameters](#) (double &xplus, double &xminus, double &yplus, double &yminus) const
- void [SetError](#) (double xplus, double xminus, double yplus, double yminus)
- void [GetError](#) (double &xplus, double &xminus, double &yplus, double &yminus) const

### 3.4.1 Detailed Description

[CParameters](#) is a class that contains the CP parameters x and y

Definition at line 9 of file CParameters.h.

### 3.4.2 Constructor & Destructor Documentation

### 3.4.2.1 CParameters()

```
CParameters::CParameters (
    double xplus,
    double xminus,
    double yplus,
    double yminus )
```

Constructor that takes the CP parameters, x and y

#### Parameters

<i>xplus</i>	r_Bcos(delta_B + gamma) for Bplus decays
<i>xminus</i>	r_Bcos(delta_B - gamma) for Bminus decays
<i>yplus</i>	r_Bsin(delta_B + gamma) for Bplus decays
<i>yminus</i>	r_Bsin(delta - gamma) for Bminus decays

Definition at line 5 of file CParameters.cpp.

## 3.4.3 Member Function Documentation

### 3.4.3.1 GetCParameters()

```
void CParameters::GetCParameters (
    double & xplus,
    double & xminus,
    double & yplus,
    double & yminus ) const
```

Function for getting CP parameters

#### Parameters

<i>xplus</i>	r_Bcos(delta_B + gamma) for Bplus decays
<i>xminus</i>	r_Bcos(delta_B - gamma) for Bminus decays
<i>yplus</i>	r_Bsin(delta_B + gamma) for Bplus decays
<i>yminus</i>	r_Bsin(delta - gamma) for Bminus decays

Definition at line 8 of file CParameters.cpp.

### 3.4.3.2 GetError()

```
void CParameters::GetError (
    double & xplus,
```

```
double & xminus,  
double & yplus,  
double & yminus ) const
```

Function for getting CP parameter errors

#### Parameters

<i>xplus</i>	xplus error
<i>xminus</i>	xminus error
<i>yplus</i>	yplus error
<i>yminus</i>	yminus error

Definition at line 22 of file CParameters.cpp.

#### 3.4.3.3 SetError()

```
void CParameters::SetError (  
    double xplus,  
    double xminus,  
    double yplus,  
    double yminus )
```

Function for setting CP parameter errors

#### Parameters

<i>xplus</i>	xplus error
<i>xminus</i>	xminus error
<i>yplus</i>	yplus error
<i>yminus</i>	yminus error

Definition at line 15 of file CParameters.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/CParameters.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/CParameters.cpp](#)

## 3.5 DDecayParameters Class Reference

```
#include <DDecayParameters.h>
```

## Public Member Functions

- [DDecayParameters](#) (const [PhaseSpaceParameterisation](#) &psp, const double &mass\_parent, const double \*mass\_decay, int events)
- [DDecayParameters](#) (std::string filename)
- void [saveCSV](#) (std::string filename) const
- std::vector< double > [GetK](#) () const
- std::vector< double > [GetKbar](#) () const
- std::vector< double > [Getc](#) () const
- std::vector< double > [Gets](#) () const

### 3.5.1 Detailed Description

[DDecayParameters](#) is the class that calculates and stores the parameters describing the  $D^0$  and  $\bar{D}^0$  decay. These parameters only need to be calculated once because they only depend on the amplitude model.

Definition at line 14 of file [DDecayParameters.h](#).

### 3.5.2 Constructor & Destructor Documentation

#### 3.5.2.1 [DDecayParameters\(\)](#) [1/2]

```
DDecayParameters::DDecayParameters (
    const PhaseSpaceParameterisation & psp,
    const double & mass_parent,
    const double * mass_decay,
    int events )
```

Constructor that takes in a [PhaseSpaceParameterisation](#) object and calculates the D decay parameters in each bin

Parameters

<i>psp</i>	<a href="#">PhaseSpaceParameterisation</a> object
<i>events</i>	Number of events in each bin for Monte Carlo integration

#### 3.5.2.2 [DDecayParameters\(\)](#) [2/2]

```
DDecayParameters::DDecayParameters (
    std::string filename )
```

Constructor that takes in the D meson hadronic parameters from a comma separated CSV file, in the order  $i$   $K_i$   $\bar{K}_i$   $c_i$   $s_i$ . First line is assumed to be column names

**Parameters**

<i>filename</i>	Filename of file with D meson hadronic parameters
-----------------	---

Definition at line 72 of file DDecayParameters.cpp.

### 3.5.3 Member Function Documentation

#### 3.5.3.1 Getc()

```
std::vector< double > DDecayParameters::Getc ( ) const
```

Function for getting cosine of the strong phase

**Returns**

c Vector of cosine of the strong phases

Definition at line 113 of file DDecayParameters.cpp.

#### 3.5.3.2 GetK()

```
std::vector< double > DDecayParameters::GetK ( ) const
```

Function for getting fractional yield K<sub>i</sub>

**Returns**

K Vector of fractional yields of D0 events

Definition at line 106 of file DDecayParameters.cpp.

#### 3.5.3.3 GetKbar()

```
std::vector< double > DDecayParameters::GetKbar ( ) const
```

Function for getting fractional yield K<sub>i</sub>

**Returns**

K Vector of fractional yields of DBAR0 events

Definition at line 109 of file DDecayParameters.cpp.

### 3.5.3.4 Gets()

```
std::vector< double > DDecayParameters::Gets ( ) const
```

Function for getting sine of the strong phase

#### Returns

s Vector of sine of the strong phases

Definition at line 117 of file DDecayParameters.cpp.

### 3.5.3.5 saveCSV()

```
void DDecayParameters::saveCSV (
    std::string filename ) const
```

Function for saving K\_i, Kbar\_i, c\_i and s\_i to a CSV file

#### Parameters

<i>filename</i>	Filename of file to save D meson hadronic parameters
-----------------	--

Definition at line 97 of file DDecayParameters.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/DDecayParameters.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/DDecayParameters.cpp](#)

## 3.6 Event Class Reference

```
#include <Event.h>
```

### Public Member Functions

- [Event](#) ()
- [Event](#) (std::vector< double > p)
- std::vector< double > [GetEventVector](#) ()
- [Event](#) (const std::vector< TLorentzVector > &p)
- double [GetInvMass2](#) (int particle1, int particle2) const
- double [GetInvMass3](#) (int particle1, int particle2, int particle3) const
- std::vector< double > [GetEvent](#) () const

### 3.6.1 Detailed Description

[Event](#) is a class for storing the four-momenta of daughter particles in a  $D \rightarrow KK\pi\pi$  decay.

Definition at line 12 of file Event.h.

### 3.6.2 Constructor & Destructor Documentation

#### 3.6.2.1 Event() [1/3]

```
Event::Event ( )
```

Default constructor for D to K+ K- pi+ pi- event with zero momentum

Definition at line 7 of file Event.cpp.

#### 3.6.2.2 Event() [2/3]

```
Event::Event (
    std::vector< double > p )
```

Constructor that takes a vector of four-momenta

Parameters

$p$	Four-momenta in the form (E, px, py, pz), in the order K+ K- pi+ pi-
-----	--

Definition at line 11 of file Event.cpp.

#### 3.6.2.3 Event() [3/3]

```
Event::Event (
    const std::vector< TLorentzVector > & p )
```

Constructor that takes a vector of four-momenta

Parameters

$p$	Vector of TLorentzVector objects, in the order K+ K- pi+ pi-
-----	--

Definition at line 18 of file Event.cpp.

### 3.6.3 Member Function Documentation

#### 3.6.3.1 GetEvent()

```
std::vector< double > Event::GetEvent ( ) const
```

Function for getting vector of four-momenta of event

##### Returns

Vector of four-momenta

Definition at line 42 of file Event.cpp.

#### 3.6.3.2 GetEventVector()

```
std::vector< double > Event::GetEventVector ( )
```

Returns the four-momenta of daughter particles as a vector

##### Returns

Four-momenta of daughter particles in the form (E, px, py, pz), in the order K+ K- pi+ pi-

Definition at line 14 of file Event.cpp.

#### 3.6.3.3 GetInvMass2()

```
double Event::GetInvMass2 (
    int particle1,
    int particle2 ) const
```

Function for getting invariant mass of two particles

##### Parameters

<i>particle1</i>	Particle 0(K+), 1(K-), 2(pi+), 3(pi-)
<i>particle2</i>	Particle 0(K+), 1(K-), 2(pi+), 3(pi-)

##### Returns

Returns invariant mass of given particles



Definition at line 28 of file Event.cpp.

#### 3.6.3.4 GetInvMass3()

```
double Event::GetInvMass3 (
    int particle1,
    int particle2,
    int particle3 ) const
```

Function for getting invariant mass of three particles

##### Parameters

<i>particle1</i>	Particle 0(K+), 1(K-), 2(pi+), 3(pi-)
<i>particle2</i>	Particle 0(K+), 1(K-), 2(pi+), 3(pi-)
<i>particle3</i>	Particle 0(K+), 1(K-), 2(pi+), 3(pi-)

##### Returns

Returns mass of given particles

Definition at line 35 of file Event.cpp.

The documentation for this class was generated from the following files:

- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Event.h
- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Event.cpp

## 3.7 EventList Class Reference

```
#include <EventList.h>
```

### Public Member Functions

- [EventList](#) ()
- void [AddEvent](#) ([Event](#) event)
- int [NumberEvents](#) () const
- std::vector< [Event](#) > [GetEvents](#) ()

#### 3.7.1 Detailed Description

[EventList](#) is a class that contains all events in a sample

Definition at line 13 of file EventList.h.

## 3.7.2 Constructor & Destructor Documentation

### 3.7.2.1 EventList()

```
EventList::EventList ( )
```

Default constructor that creates an empty [EventList](#)

Definition at line 7 of file EventList.cpp.

## 3.7.3 Member Function Documentation

### 3.7.3.1 AddEvent()

```
void EventList::AddEvent (
    Event event )
```

Function that adds an [Event](#) to the [EventList](#)

Parameters

<i>event</i>	New <a href="#">Event</a> object to be added to the <a href="#">EventList</a>
--------------	---

Definition at line 10 of file EventList.cpp.

### 3.7.3.2 GetEvents()

```
std::vector< Event > EventList::GetEvents ( )
```

Function that returns the vector of [Event](#) objects

Returns

Vector of [Event](#) objects

Definition at line 18 of file EventList.cpp.

### 3.7.3.3 NumberEvents()

```
int EventList::NumberEvents ( ) const
```

Function that returns total number of events in this [EventList](#)

Definition at line 14 of file EventList.cpp.

The documentation for this class was generated from the following files:

- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/[EventList.h](#)
- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/[EventList.cpp](#)

## 3.8 Fitter Class Reference

```
#include <Fitter.h>
```

### Public Member Functions

- [Fitter](#) ([BinList](#) binlist, [DDecayParameters](#) ddparameters)
- void [DoFit](#) ([CPPParameters](#) &cparameters)

### 3.8.1 Detailed Description

[Fitter](#) is a class for maximising the likelihood and obtaining the CP violation parameters for a B meson decay

Definition at line 13 of file Fitter.h.

### 3.8.2 Constructor & Destructor Documentation

#### 3.8.2.1 Fitter()

```
Fitter::Fitter (
    BinList binlist,
    DDecayParameters ddparameters )
```

Constructor that takes in a [BinList](#) object of input data and D meson decay parameters

#### Parameters

<i>binlist</i>	Input data events
<i>ddecayparameters</i>	Parameters describing the D meson decay

Definition at line 11 of file Fitter.cpp.

### 3.8.3 Member Function Documentation

#### 3.8.3.1 DoFit()

```
void Fitter::DoFit (
    CParameters & cpparameters )
```

Function for doing fit and returning the CP violation parameters (by reference)

##### Parameters

<i>cpparameters</i>	Initial guess of CP violation parameters, function replaces these with the fitted parameters
---------------------	--

Definition at line 14 of file Fitter.cpp.

The documentation for this class was generated from the following files:

- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Fitter.h
- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Fitter.cpp

## 3.9 Generator Class Reference

```
#include <Generator.h>
```

### Public Member Functions

- [Generator](#) (const double &mass\_parent, const Double\_t \*mass\_decay, Int\_t particles)
- std::vector< TLorentzVector > [Generate](#) ()

#### 3.9.1 Detailed Description

[Generator](#) is a class that generates uniformly distributed events in phase space, assuming the parent particle is at rest

Definition at line 13 of file Generator.h.

#### 3.9.2 Constructor & Destructor Documentation

##### 3.9.2.1 Generator()

```
Generator::Generator (
    const double & mass_parent,
    const Double_t * mass_decay,
    Int_t particles )
```

Constructor that takes in the particle masses and sets up phase space

## Parameters

<i>mass_parent</i>	Mass of parent particle
<i>mass_decay</i>	mass of decay particles
<i>particles</i>	Number of particles in the final state

Definition at line 9 of file Generator.cpp.

### 3.9.3 Member Function Documentation

#### 3.9.3.1 Generate()

```
std::vector< TLorentzVector > Generator::Generate ( )
```

Function that generates a random unweighted event

Definition at line 15 of file Generator.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/Generator.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/Generator.cpp](#)

## 3.10 Likelihood Class Reference

```
#include <Likelihood.h>
```

### Public Member Functions

- [Likelihood](#) ([BinList](#) bins, [DDecayParameters](#) ddparameters)
- double [operator\(\)](#) (const double \*cpparameters)

#### 3.10.1 Detailed Description

[Likelihood](#) is a class for calculating the likelihood, given an [EventList](#) of input data and a set of D meson decay parameters and CP violation parameters in B meson decays () operator is overloaded to make the likelihood function easily accessible

Definition at line 13 of file Likelihood.h.

### 3.10.2 Constructor & Destructor Documentation

#### 3.10.2.1 Likelihood()

```
Likelihood::Likelihood (
    BinList bins,
    DDecayParameters ddparameters )
```

Constructor that takes in an [BinList](#) object with input data and a [DDecayParameters](#) object

## Parameters

<i>events</i>	<a href="#">BinList</a> object with the input data
<i>ddecayparameters</i>	A <a href="#">DDecayParameters</a> object with the parameters for the D meson decay

Definition at line 10 of file Likelihood.cpp.

### 3.10.3 Member Function Documentation

#### 3.10.3.1 operator()

```
double Likelihood::operator() (
    const double * cparameters )
```

Operator overload of () to easily access the likelihood function

## Parameters

<i>cparameters</i>	A <a href="#">CParameters</a> object with the CP violation parameters for the B meson decay
--------------------	---

## Returns

$-2 \cdot \ln(L)$ , where L is the likelihood function

Definition at line 13 of file Likelihood.cpp.

The documentation for this class was generated from the following files:

- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/include/Likelihood.h](#)
- [/data/lhcb/users/tat/KKpipi\\_Binned\\_Fit/src/Likelihood.cpp](#)

## 3.11 PhaseSpaceParameterisation Class Reference

```
#include <PhaseSpaceParameterisation.h>
```

## Public Member Functions

- [PhaseSpaceParameterisation](#) ()
- int [WhichBin](#) (const [Event](#) &event)
- int [NumberOfBins](#) ()

### 3.11.1 Detailed Description

[PhaseSpaceParameterisation](#) is a class that contains the information about how phase space is divided into bins. [PhaseSpaceParameterisation](#) contains a very coarse and arbitrary binning of phase space. A more sophisticated binning can be added by adding a new class that inherits from [PhaseSpaceParameterisation](#).

Definition at line 13 of file `PhaseSpaceParameterisation.h`.

### 3.11.2 Constructor & Destructor Documentation

#### 3.11.2.1 PhaseSpaceParameterisation()

```
PhaseSpaceParameterisation::PhaseSpaceParameterisation ( )
```

Default constructor

Definition at line 7 of file `PhaseSpaceParameterisation.cpp`.

### 3.11.3 Member Function Documentation

#### 3.11.3.1 NumberOfBins()

```
int PhaseSpaceParameterisation::NumberOfBins ( )
```

Function that returns the number of bins in the binning scheme

Returns

Number of bins

Definition at line 23 of file `PhaseSpaceParameterisation.cpp`.

#### 3.11.3.2 WhichBin()

```
int PhaseSpaceParameterisation::WhichBin (
    const Event & event )
```

Function that determines which bin an event belongs to

**Parameters**

<i>event</i>	The event we want to determine the bin of
--------------	---

**Returns**

[Bin](#) number

Definition at line 10 of file PhaseSpaceParameterisation.cpp.

The documentation for this class was generated from the following files:

- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/[PhaseSpaceParameterisation.h](#)
- /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/[PhaseSpaceParameterisation.cpp](#)



## Chapter 4

# File Documentation

### 4.1 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Amplitude.h File Reference

```
#include <vector>
#include <string>
#include <complex>
```

#### Classes

- class [Amplitude](#)

### 4.2 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Bin.h File Reference

```
#include "EventList.h"
#include "Event.h"
```

#### Classes

- class [Bin](#)

### 4.3 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/BinList.h File Reference

```
#include <vector>
#include "PhaseSpaceParameterisation.h"
#include "Event.h"
#include "Bin.h"
#include "DDecayParameters.h"
#include "CParameters.h"
```

## Classes

- class [BinList](#)

## 4.4 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/CParameters.h File Reference

## Classes

- class [CParameters](#)

## 4.5 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/DDecayParameters.h File Reference

```
#include <vector>
#include <string>
#include "PhaseSpaceParameterisation.h"
```

## Classes

- class [DDecayParameters](#)

## 4.6 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Event.h File Reference

```
#include <vector>
#include "TLorentzVector.h"
```

## Classes

- class [Event](#)

## 4.7 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/EventList.h File Reference

```
#include "Event.h"
#include "TTree.h"
#include <vector>
```

## Classes

- class [EventList](#)

## 4.8 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/FitGamma.h File Reference

## 4.9 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Fitter.h File Reference

```
#include "BinList.h"
#include "DDecayParameters.h"
#include "CParameters.h"
```

## Classes

- class [Fitter](#)

## 4.10 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Generator.h File Reference

```
#include <vector>
#include "TLorentzVector.h"
#include "TGenPhaseSpace.h"
```

## Classes

- class [Generator](#)

## 4.11 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/HadronicParameters.h File Reference

## 4.12 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/Likelihood.h File Reference

```
#include "BinList.h"
#include "DDecayParameters.h"
```

## Classes

- class [Likelihood](#)

### 4.13 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/include/PhaseSpaceParameterisation.h File Reference

```
#include "Event.h"
```

## Classes

- class [PhaseSpaceParameterisation](#)

### 4.14 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Amplitude.cpp File Reference

```
#include <vector>
#include <string>
#include <complex>
#include <algorithm>
#include <dlfcn.h>
#include "Amplitude.h"
```

### 4.15 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Bin.cpp File Reference

```
#include "Bin.h"
#include "EventList.h"
#include "Event.h"
```

### 4.16 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/BinList.cpp File Reference

```
#include <vector>
#include <functional>
#include "Bin.h"
#include "BinList.h"
#include "PhaseSpaceParameterisation.h"
#include "Event.h"
#include "TTree.h"
#include "DDecayParameters.h"
#include "CParameters.h"
#include "TMath.h"
```

## 4.17 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/CMakeLists.txt File Reference

## 4.18 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/CPPParameters.cpp File Reference

```
#include "CPPParameters.h"
```

## 4.19 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/DDecayParameters.cpp File Reference

```
#include <algorithm>
#include <vector>
#include <complex>
#include <iostream>
#include <string>
#include <fstream>
#include <sstream>
#include "DDecayParameters.h"
#include "BinList.h"
#include "Generator.h"
#include "TLorentzVector.h"
#include "Event.h"
#include "EventList.h"
#include "Bin.h"
#include "TMath.h"
#include "Amplitude.h"
```

## 4.20 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Event.cpp File Reference

```
#include "Event.h"
#include "TLorentzVector.h"
#include "TMath.h"
```

## 4.21 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/EventList.cpp File Reference

```
#include <vector>
#include "EventList.h"
#include "Event.h"
```

## 4.22 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Fitter.cpp File Reference

```
#include "Fitter.h"
#include "BinList.h"
#include "DDecayParameters.h"
#include "CParameters.h"
#include "Likelihood.h"
#include "Minuit2/Minuit2Minimizer.h"
#include "Math/Functor.h"
```

## 4.23 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Generator.cpp File Reference

```
#include <vector>
#include "Generator.h"
#include "TGenPhaseSpace.h"
#include "TLorentzVector.h"
#include "TRandom3.h"
```

## 4.24 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/Likelihood.cpp File Reference

```
#include "Likelihood.h"
#include "DDecayParameters.h"
#include "CParameters.h"
#include "BinList.h"
#include "TMath.h"
#include "Math/PdfFuncMathCore.h"
```

## 4.25 /data/lhcb/users/tat/KKpipi\_Binned\_Fit/src/PhaseSpace↵ Parameterisation.cpp File Reference

```
#include <vector>
#include "PhaseSpaceParameterisation.h"
#include "Event.h"
```

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