Status of ComPWA
(Common Partial Wave Analysis)

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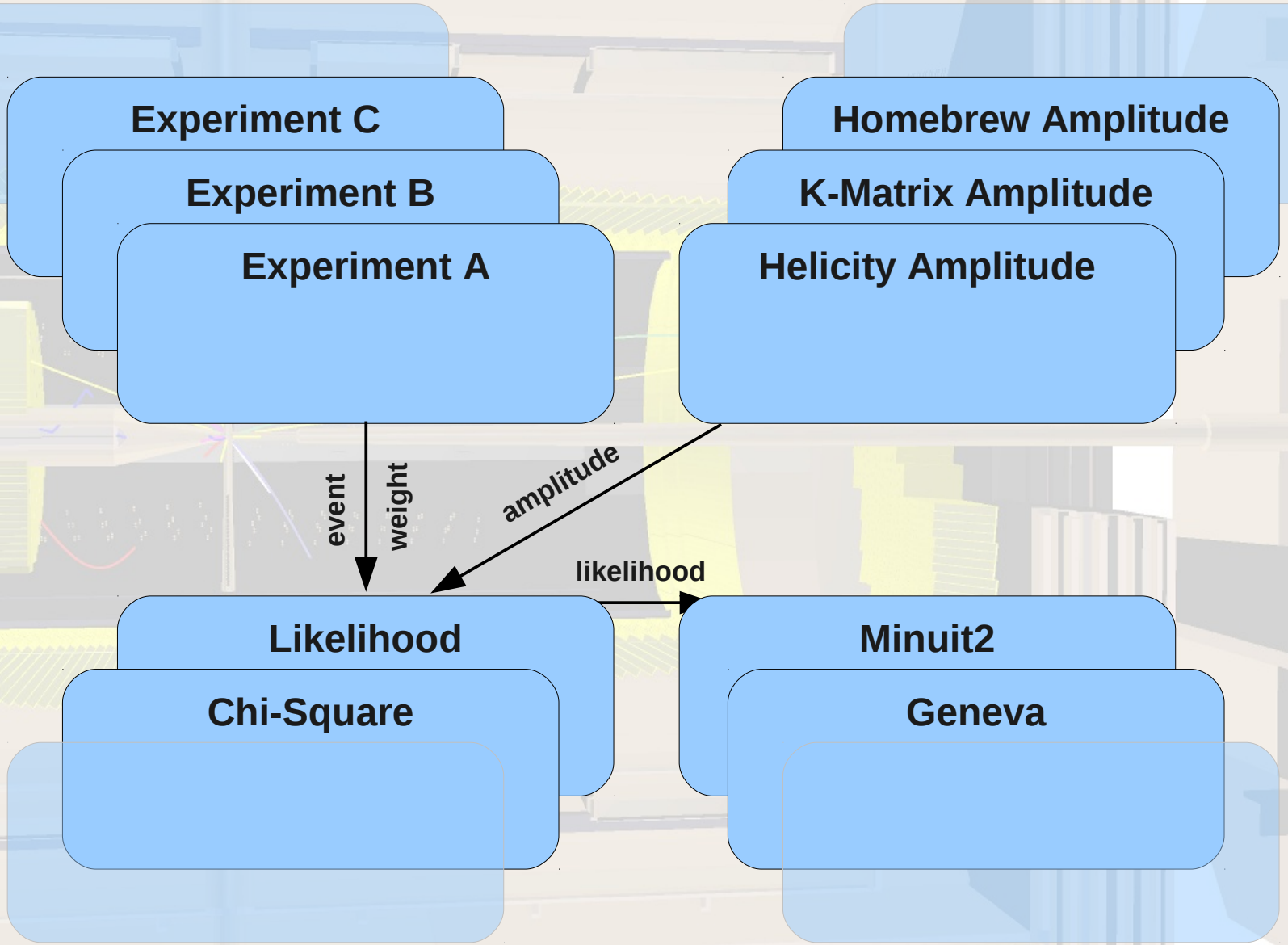
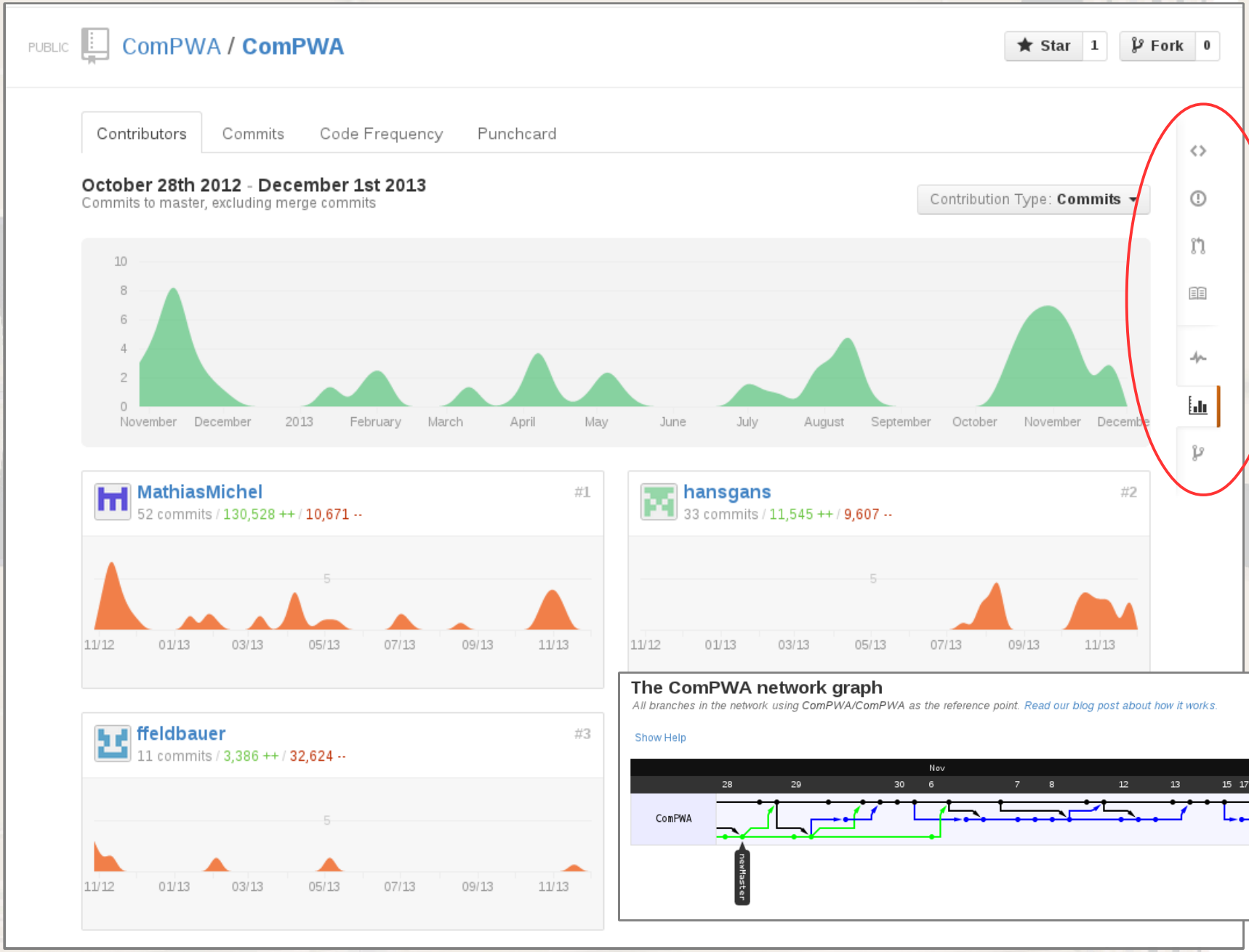
ComPWA Framework



GitHub



Tools & Navigation

GitHub

- github.com → search “ComPWA” → first result
- Public Links:

  Repository: https://github.com/ComPWA/ComPWA/

  Wiki pages: https://github.com/ComPWA/ComPWA/wiki

  Documentation: http://compwa.github.io/ComPWA/
- Copyright: GPL

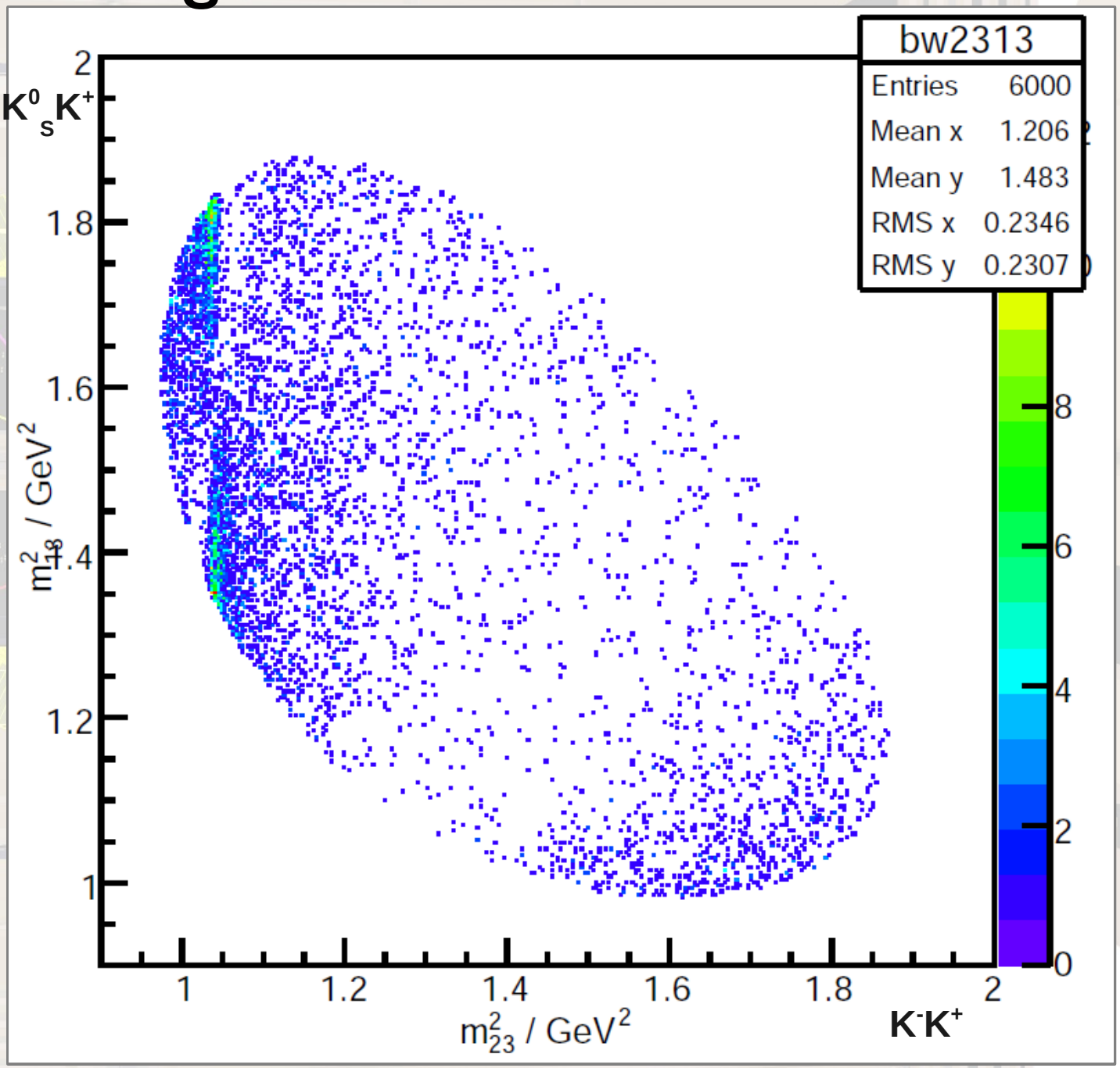
New Tests by Peter Weidenkaff

$$D_0 \rightarrow K^0_S K^- K^+$$

- Comparison of BaBar Analysis results with ComPWA
- Model: extended relativistic Breit-Wigner-Sum-Model
- Resonances simulated:

a_{00}	$\rightarrow K^+ K^-$
a_0^+	$\rightarrow K^0_S K^+$
Φ	$\rightarrow K^+ K^-$
$f_0(1400)$	$\rightarrow K^+ K^-$

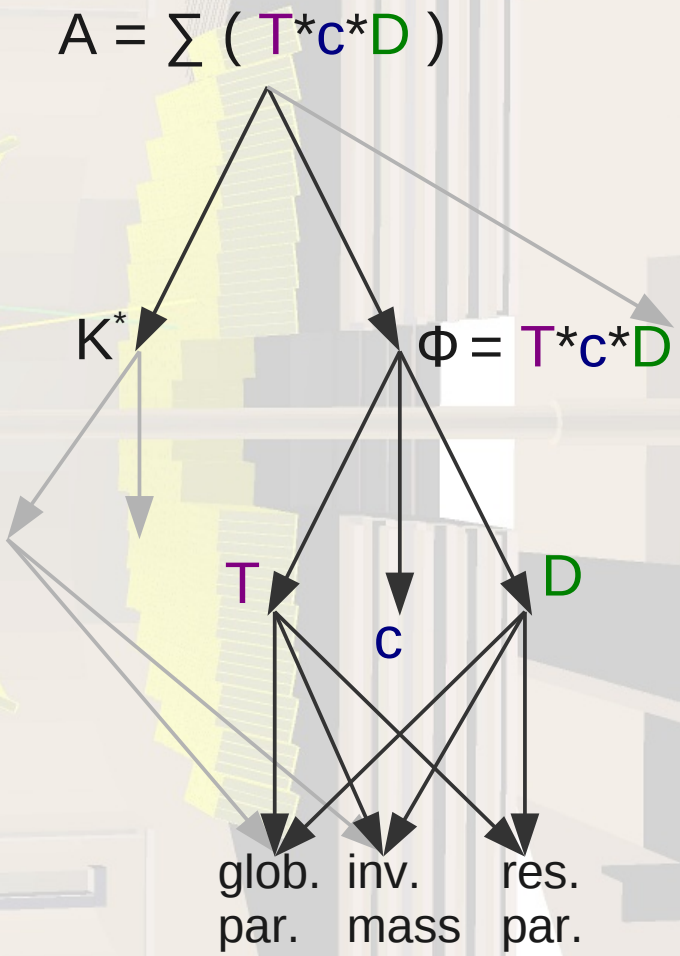
$D_0 \to K^0_S K^- K^+$ ComPWA-Dalitz



FunctionTree

$$I = \left| \sum_n T_n r_n e^{i\varphi_n} D_n \right|^2$$

T = Breit-Wigner Function
D = D-Wigner Function
r = Strength of Resonance
φ = Phase of Resonance



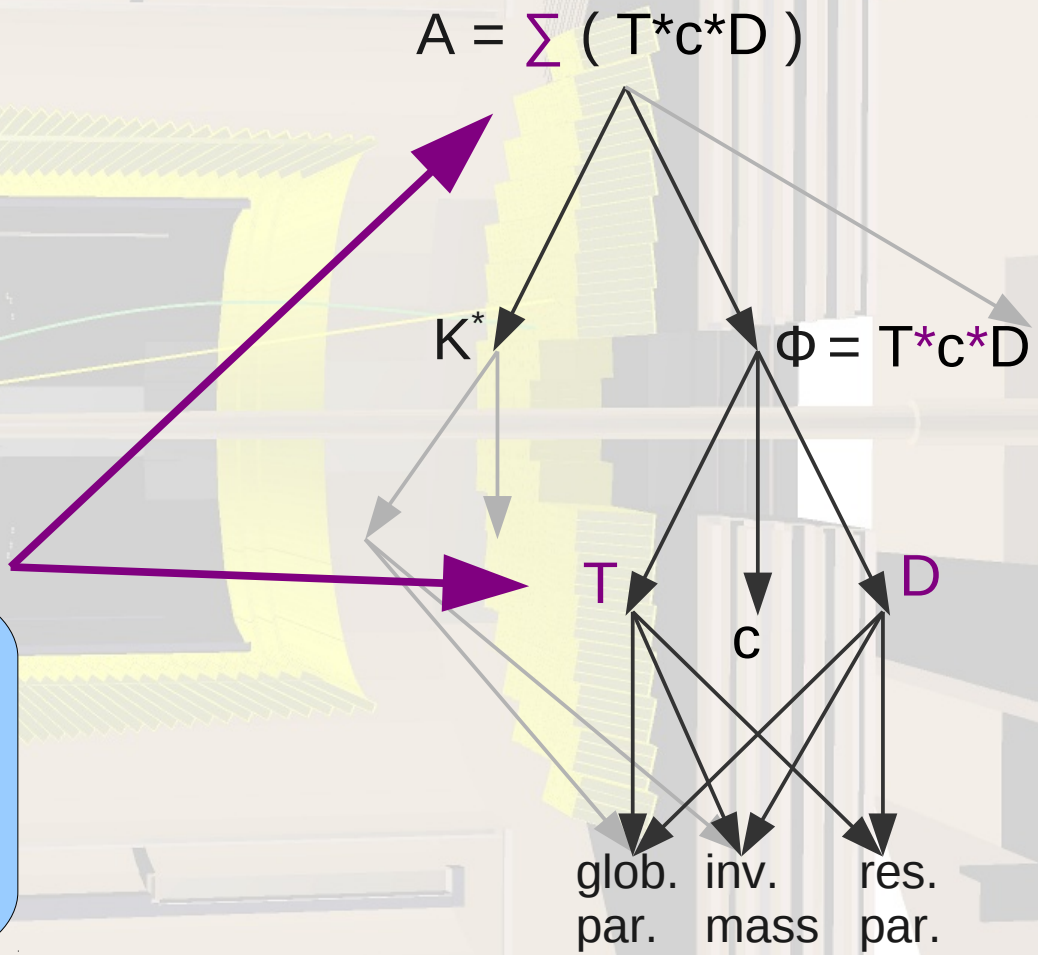
FunctionTree: Strategies

Node

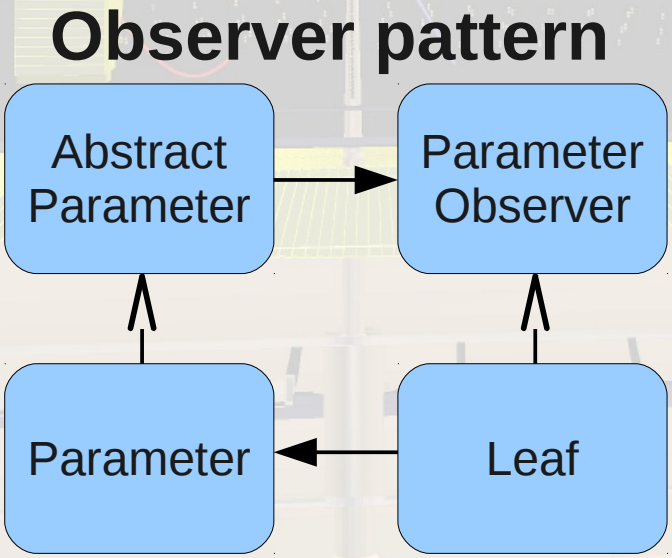
List of parents
List of children
My parameter
Strategy

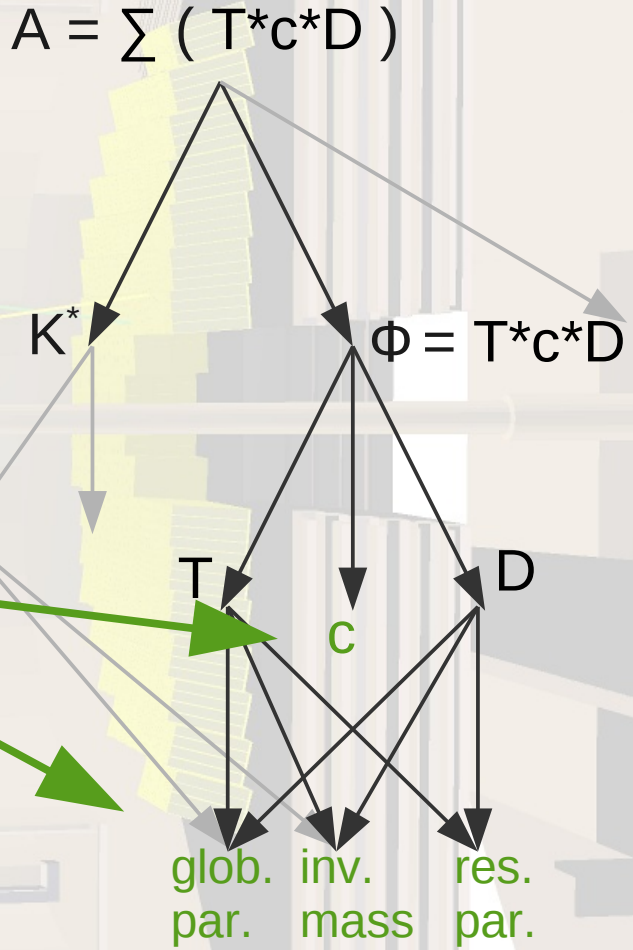
Strategy pattern

execute function
input:
parameter list (children)
output:
calculated parameter

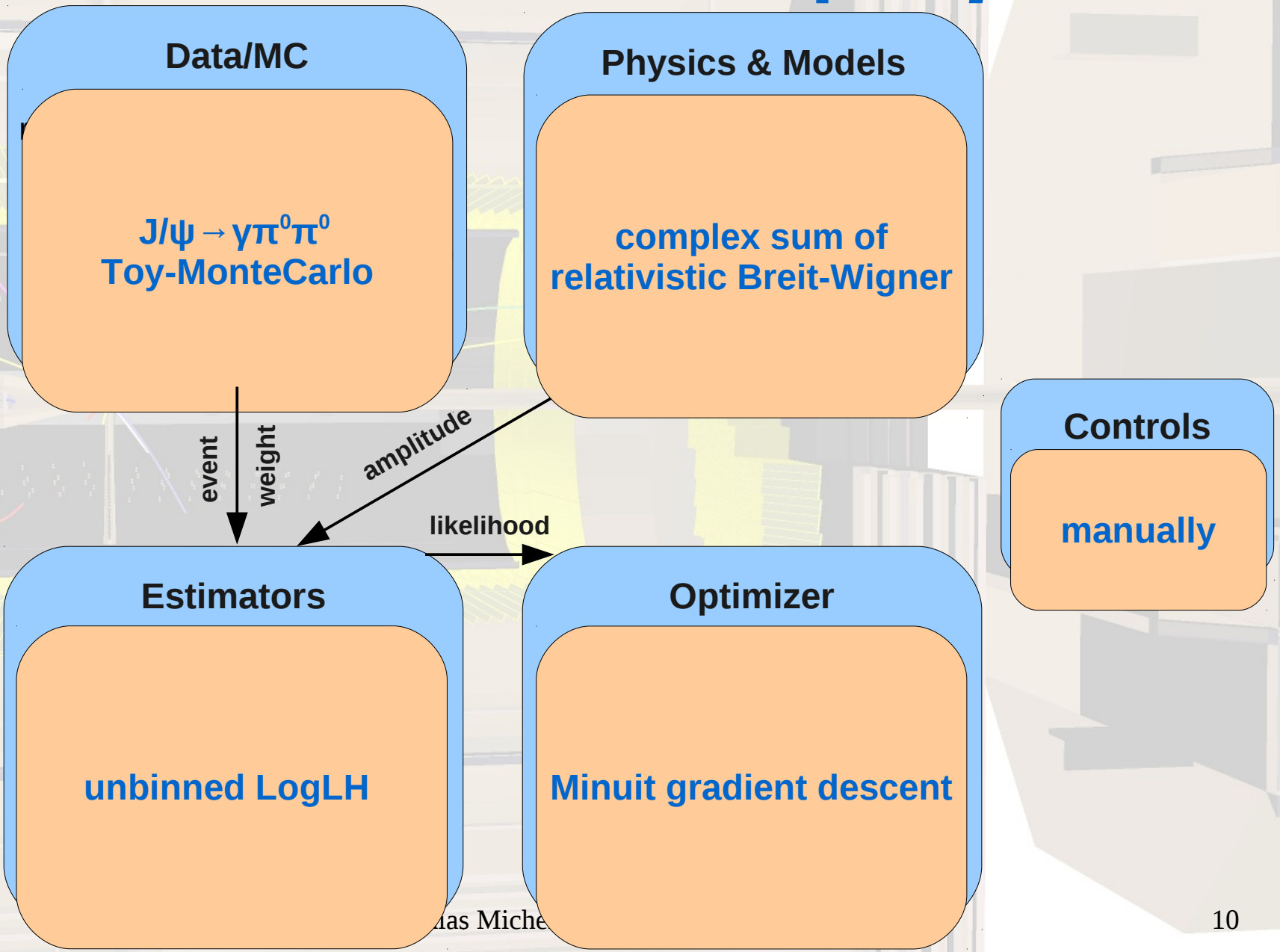


FunctionTree: Parameters





Test Environment: $J/\psi \rightarrow \gamma\pi^0\pi^0$

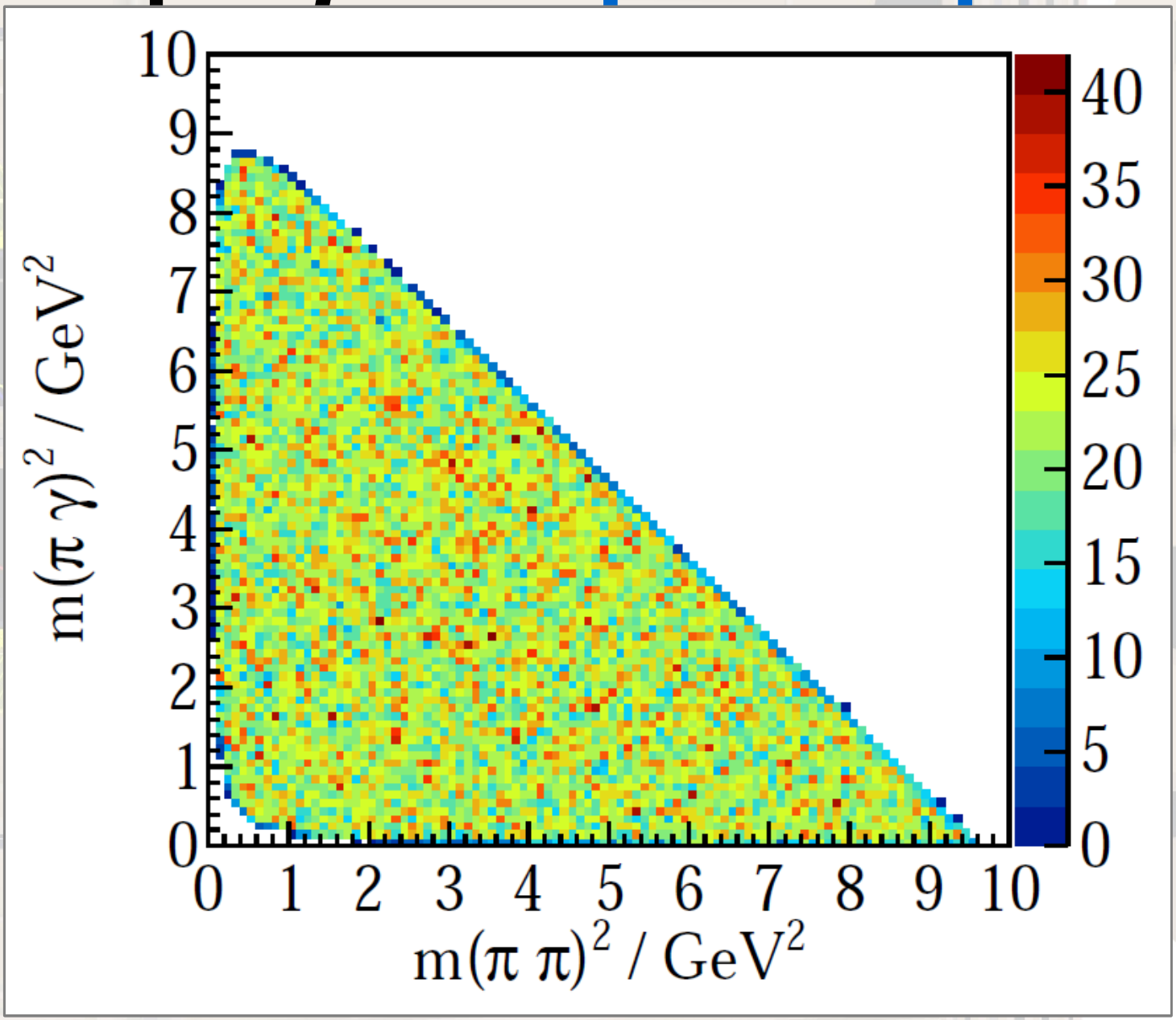


$J/\psi \rightarrow \gamma\pi^0\pi^0$ Model

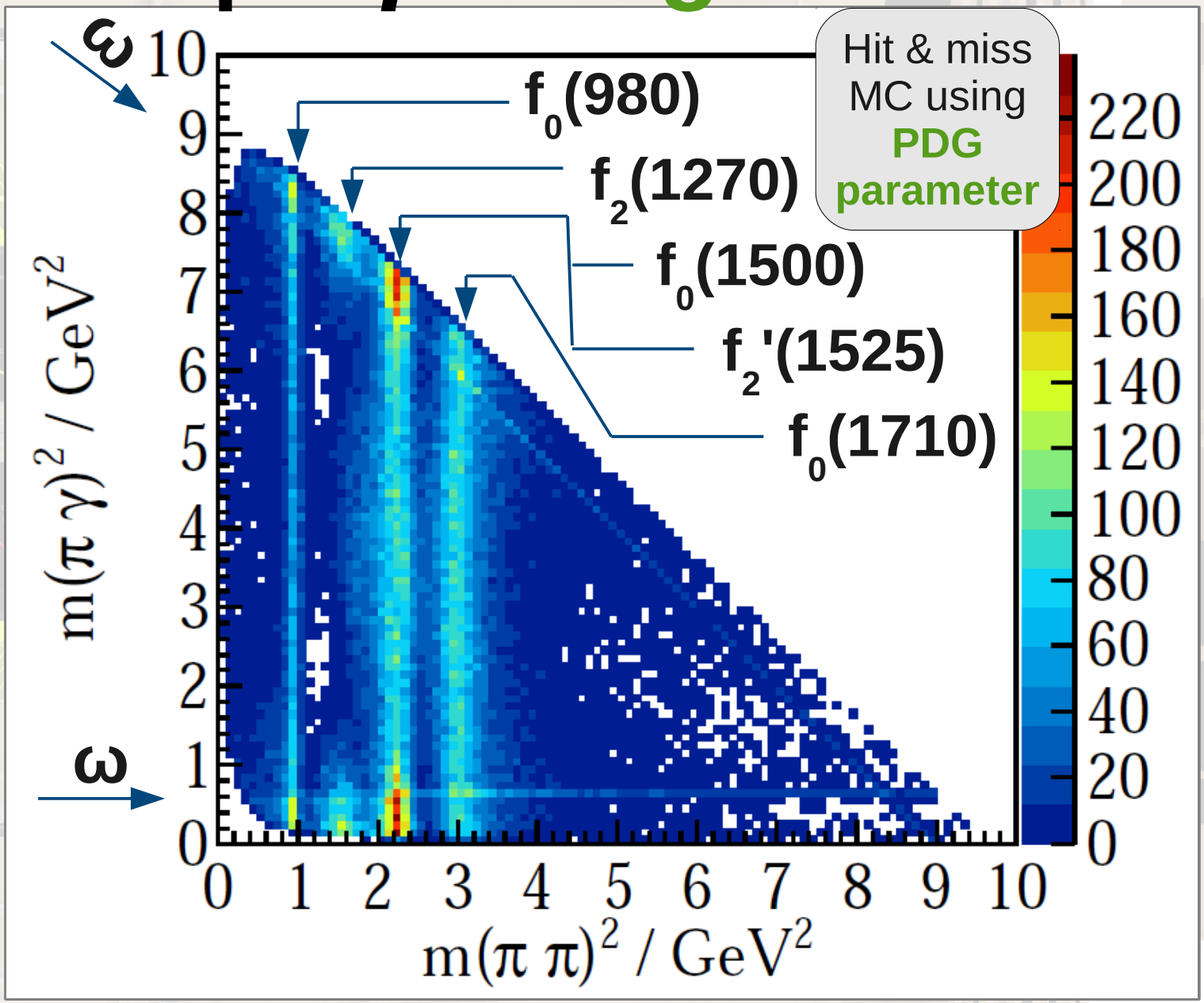
$$I = \left| \sum_n T_n r_n e^{i\varphi_n} D_n \right|^2$$

T = Breit-Wigner Function
D = D-Wigner Function
r = Strength of Resonance
φ = Phase of Resonance

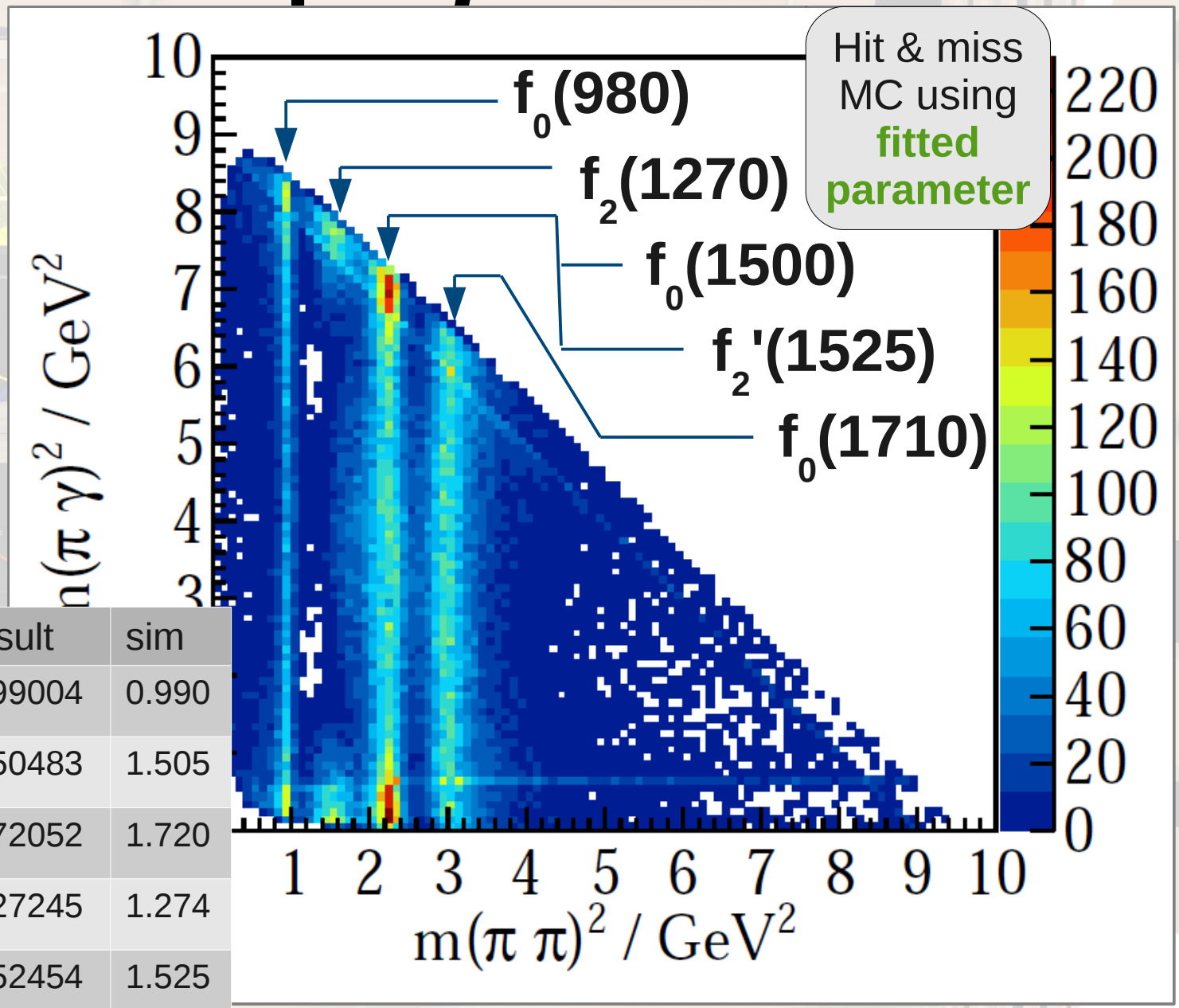
$J/\psi \rightarrow \gamma\pi^0\pi^0$ phasespace



$J/\psi \rightarrow \gamma\pi^0\pi^0$ generated



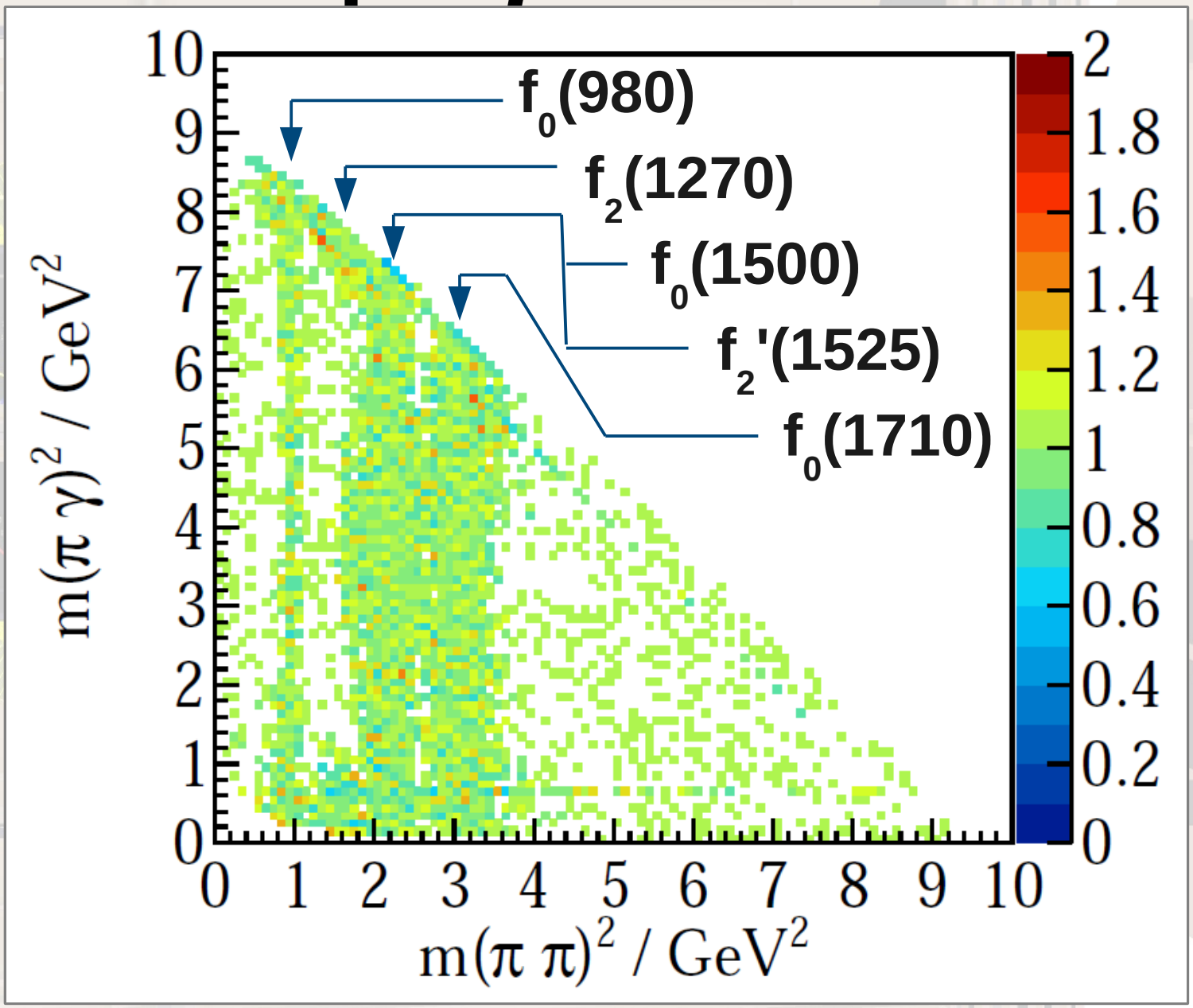
$J/\psi \rightarrow \gamma\pi^0\pi^0$ first fit



mass of	result	sim
$f_0(980)$	0.99004	0.990
$f_0(1500)$	1.50483	1.505
$f_0(1710)$	1.72052	1.720
$f_2(1270)$	1.27245	1.274
$f_2(1525)$	1.52454	1.525

startvalues: 0.95 optimal

$J/\psi \rightarrow \gamma\pi^0\pi^0$ ratio



Status & Outlook

Language and Dependencies
- C++11
- Boost
- Boost.Build

Optional External Packages Used
- Root
- qft++
- Minuit2
- Geneva

Documentation
- Doxygen
- Doku Wiki

Version-Control
- Git

Work in progress!

New Stuff:
- XML Particle Table
- Sum Model extended
- Function Tree

Biggest ToDo's
- controls and configuration
- documentation module
- more physics cases

Contact

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Github.com/ComPWA/ComPWA