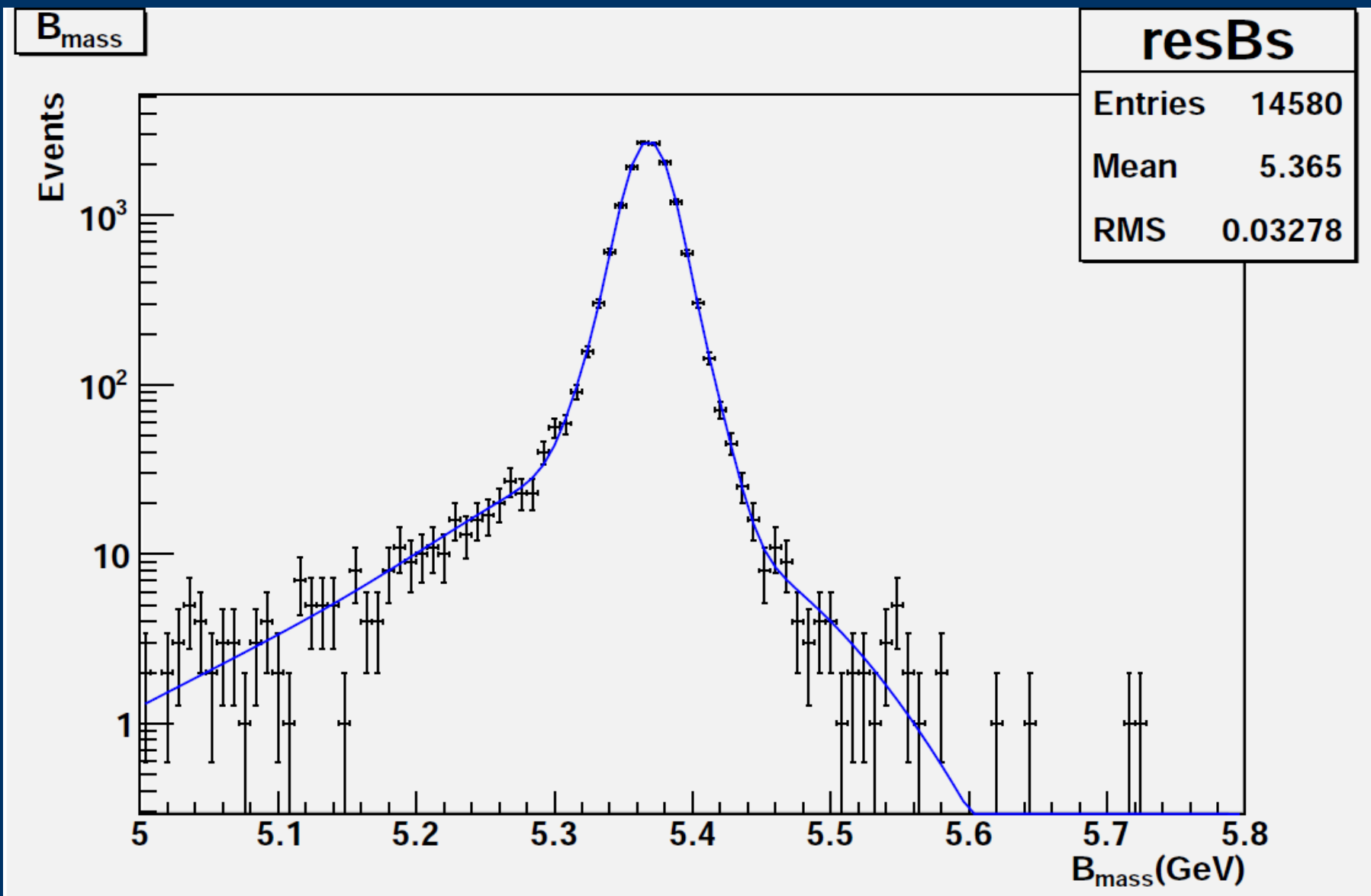


DEA Plots Revision  
Celestino Rodríguez Cobo

# Mass Lineshape



# Mass Lineshape

FCN=44.6218 FROM MINOS STATUS=PROBLEMS 11946 CALLS 17717 TOTAL  
 EDM=1.4192e-05 STRATEGY= 1 ERROR MATRIX ACCURATE  
 EXT PARAMETER PARABOLIC MINOS ERRORS  
 NO. NAME VALUE ERROR NEGATIVE POSITIVE

1	fr2	7.95609e-01	1.76780e-01		
2	frac	1.98995e-01	1.73400e-01		
3	mabs	5.36843e+00	1.62420e-04	-1.61814e-04	1.62004e-04
4	pm	-1.04356e+00	1.55301e+00	-1.02353e+00	2.26084e+00
5	sal	7.97407e+00	2.64527e+00		2.57610e+00
6	sig	2.52850e-02	6.17781e-03		2.44031e-03
7	sig2	1.39315e-02	1.64141e-03	-7.12987e-04	5.83349e-04
8	sig3	8.61693e-02	2.51749e-02	-1.37026e-02	1.79639e-02
9	weig	6.95152e-03	1.57632e-03	-1.51857e-03	1.66319e-03

# Mass Lineshape

$$L(\text{mass}, mb, s, \sigma_1, \sigma_2, \sigma_3, fl, fl2, pm, w) = (1 + pm|m - mb|)(wA + (1 - w)B)$$

$$A = f(\text{mass}, mb, s) \otimes \text{Res}(\text{mass}, 0, \sigma_1, \sigma_2, \sigma_3, fl, fl2)$$

$$B = \text{Res}(\text{mass}, mb, \sigma_1, \sigma_2, \sigma_3, fl, fl2)$$

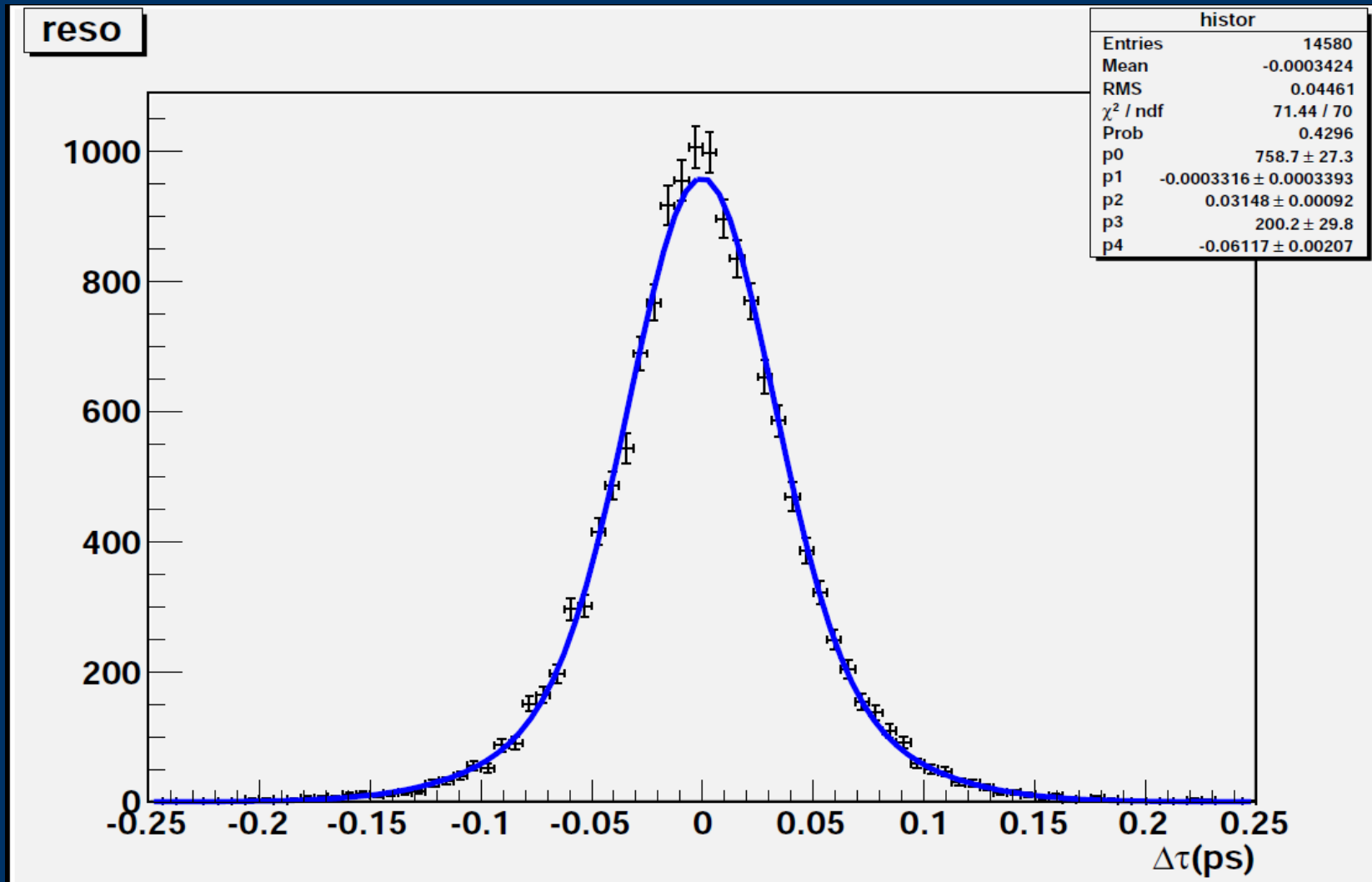
$$\text{Res}(\text{mass}, mb, \sigma_1, \sigma_2, \sigma_3, fl, fl2) = fl * \exp(-0.5 * (\frac{\text{mass} - mb}{\sigma_1})^2)$$

$$+ fl2 * \exp(-0.5 * (\frac{\text{mass} - mb}{\sigma_2})^2) + (1 - fl - fl2) * \exp(-0.5 * (\frac{\text{mass} - mb}{\sigma_3})^2)$$

$$f(\text{mass}, mb, s) = \text{Exp}(s(\text{mass} - mb)) \cdot \Theta_H(\text{mass} - mb)$$

- Three effects are modelled
- Resolution (3 Gaussians)
- Impact parameter acceptance effect( slope)
- Radiative tail (exponential)
- Fair agreement

# Temporal resolution



$$Res(t) = p_0 * \exp(-0.5 * (\frac{t - p_1}{p_2})^2) + p_3 * \exp(-0.5 * (\frac{t - p_1}{p_4})^2)$$

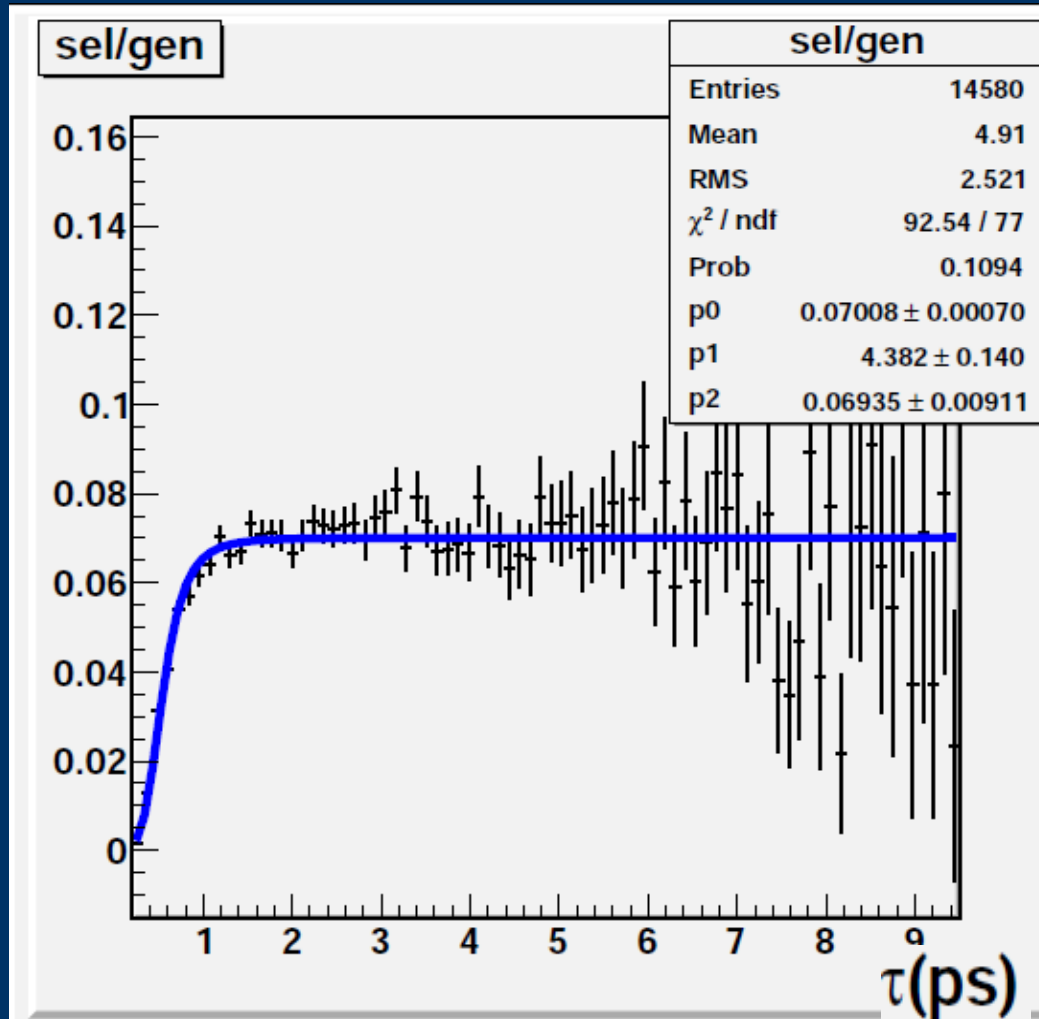
# Temporal resolution

FCN=71.4419 FROM MIGRAD STATUS=CONVERGED 65 CALLS 66 TOTAL  
 EDM=1.73289e-11 STRATEGY= 1 ERROR MATRIX ACCURATE

EXT PARAMETER			STEP	FIRST	
NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	p0	7.58723e+02	2.73147e+01	3.80323e-02	-3.54817e-07
2	p1	-3.31604e-04	3.39275e-04	1.40869e-06	8.24604e-03
3	p2	3.14775e-02	9.22570e-04	1.22525e-06	-1.14621e-02
4	p3	2.00180e+02	2.97794e+01	1.77149e-02	-6.39079e-07
5	p4	-6.11696e-02	2.07488e-03	2.25642e-06	2.15996e-03

0

# Acceptance parametrization



- Resolution degraded-MC used.

# Acceptance parametrization

```

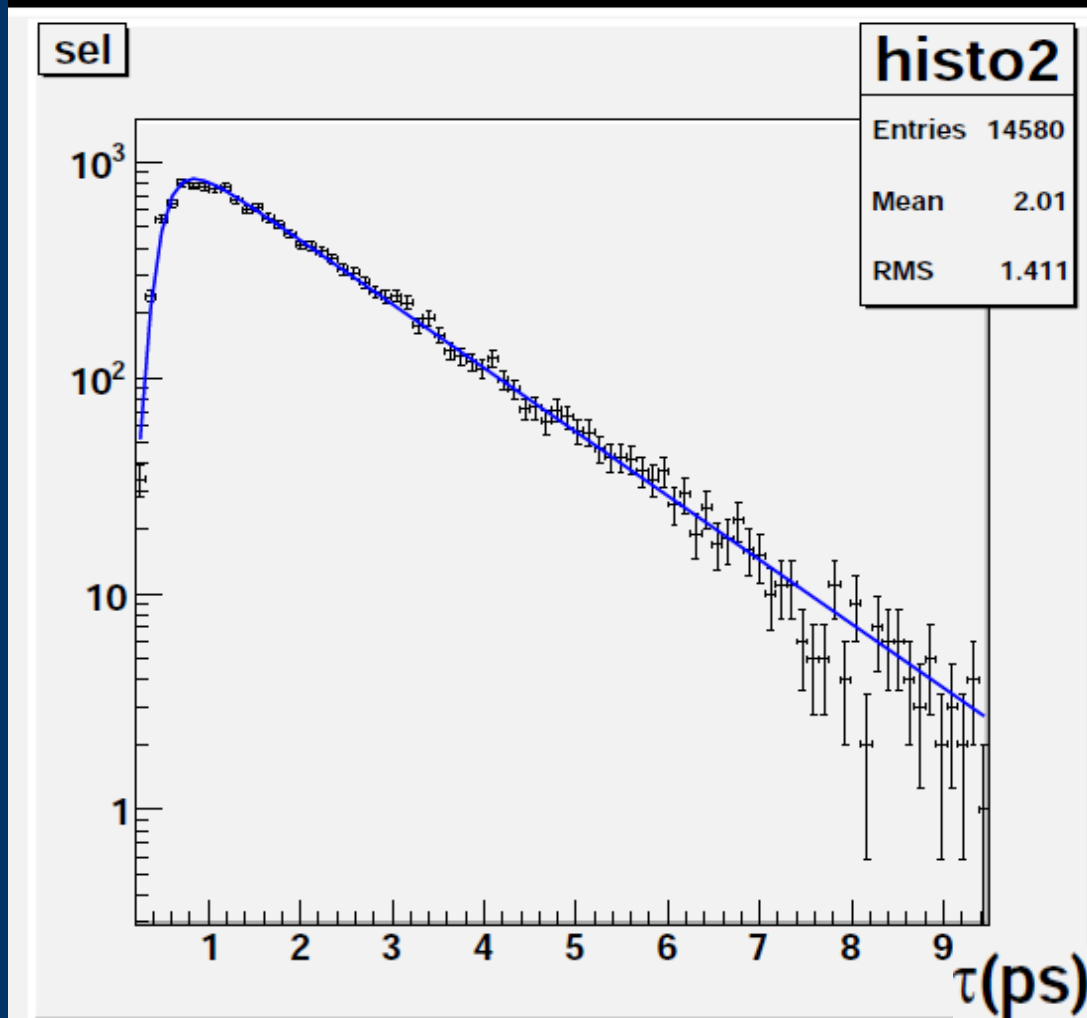
FCN=92.5406 FROM MIGRAD   STATUS=CONVERGED   403 CALLS   404 TOTAL
          EDM=7.44777e-11 STRATEGY= 1   ERROR MATRIX ACCURATE
EXT PARAMETER                STEP    FIRST
NO.  NAME    VALUE          ERROR    SIZE    DERIVATIVE
 1  p0      7.00828e-02  7.00399e-04  2.66544e-06 -1.16761e-02
 2  p1      4.38219e+00  1.39542e-01  2.34971e-04 -1.26785e-04
 3  p2      6.93510e-02  9.10738e-03  1.41892e-05 -1.97360e-03
0

```

- Resolution degraded-MC used.



# Time Acceptance and resolution Combined



- Odd Chi2 result( 100.4/77)

# *Time Acceptance and resolution Combined*

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\*\* 23 \*\*MINOS 1500

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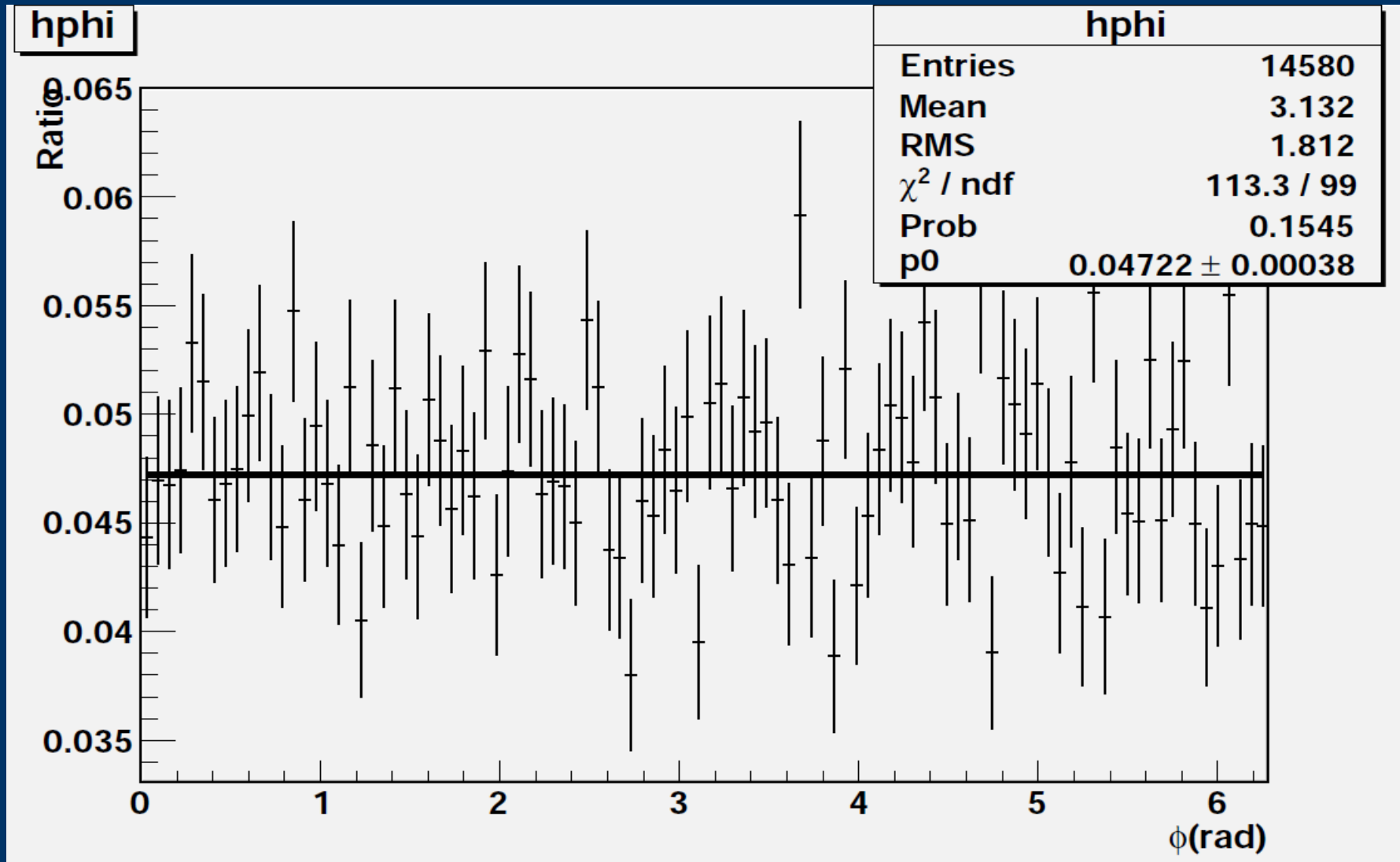
FCN=100.399 FROM MINOS STATUS=SUCCESSFUL 188 CALLS 356 TOTAL

EDM=0.000138346 STRATEGY= 1 ERROR MATRIX ACCURATE

EXT	PARAMETER	PARABOLIC	MINOS ERRORS		
NO.	NAME	VALUE	ERROR	NEGATIVE	POSITIVE
1	a1	4.40005e+00	1.54955e-01	-1.50823e-01	1.59929e-01
2	b1	6.84498e-02	1.07991e-02	-1.02041e-02	1.14630e-02
3	gamma	6.82855e-01	6.81568e-03	-6.76931e-03	6.88004e-03

- Odd Chi2 result( 100.4/77)
- 
-

# Phi acceptance



- Flat compatibility. Sort of.

## *Theta Angular acceptance : issues.*

- Plots seem to be rather difficult to modelize
- Polynomial models are not really good.
- Model is perhaps too simplistic?