

Averaging Tool

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23.02.2021

New Framework

- Can take a look yourself:

```
python3 -m venv hflav
source hflav/bin/activate
pip3 install iminuit matplotlib scipy requests
git clone ssh://git@gitlab.cern.ch:7999/hflav/averaging.git
cd averaging
git checkout new_framework
python3 setup.py install
cd
git clone ssh://git@gitlab.cern.ch:7999/hflav/b2charm.git
cd b2charm
git checkout thomas-json-data
python3 -m averaging
```

Example Output

Fitting BR_Bsbar_Jpsi_f11285, BR_Bsbar_Jpsi_f11285.BR_f11285_pi+pi-pi+pi-, BR_B0bar_Jpsi_f11285.BR_f11285_pi+pi-pi+pi-

FCN = 1.691e+04 EDM = 3.54e-13 (Goal: 0.0001)		Nfcn = 51975		
Valid Minimum	Valid Parameters	No Parameters at limit		
Below EDM threshold (goal x 10)		Below call limit		
Covariance	Hesse ok	APPROXIMATE	NOT pos. def.	FORCED

BR_Bsbar_Jpsi_f11285

= 7.14 +-0.99 +0.83-0.91 +-0.41(f_1_1295_BR) e-4 (LHCb)

PDG: 7.20067751405952e-05 +1.37922374271088e-05 -1.39830515799288e-05

	Name	Value	Hesse Err	Minos Err-	Minos Err+	Limit-	Limit+	Fixed
0	x45	0.714e-3	0.015e-3	-0.134e-3	0.129e-3			

-28.456292042286208% correlation with f_1_1295_BR

6.385101015505136% correlation with BR_B0bar_Jpsi_f11285

16.878274377362974% correlation with BR_Bsbar_Jpsi_f11285.BR_f11285_pi+pi-pi+pi-

28.427462072778916% correlation with BR_B0bar_Jpsi_f11285.BR_f11285_pi+pi-pi+pi-

Work Packages

- Revision of Measurement class to allow for specification of dependencies on input/nuisance parameters and the construction of a negative log likelihood (NLL)
- Revision of Publication class to allow for marking of preliminary/new results, change identifier to inspire ID
- Revision of Parameter class to support input/nuisance parameters and reference to PDG
- Performant likelihood fit
- More modular code structure
- More flexible scheme for configuration of output generation, decouple output generation from averaging
- Scheme for presenting correlations and changes due to updated inputs
- Change data format from xml to json
- Conversion from xml to json
- Document design
- Documentation for users
- Update inspire import to new API
- API for our averages
- Code review
- Beta testing
- Unit / integration tests?

Further Items

- Semi-automatic matching of PDG IDs to our parameters based on publications entering the averages
- Edition and mode number already included in PDG API
- GSoC proposal by Daniel