

Wei-Ming Yao (LBNL)

- **Introduction**
- **Reference**
- **Add measurements**
  - **Best limit or not**
  - **Add new measurement**
  - **Add measurement with `br_adjust` rescaling**
- **Toolbox**
  - **Creating new decay and Branching ratio**
- **Sign-off**

**Contact: send email to [pdg-feedback-workspace@pdg.lbl.gov](mailto:pdg-feedback-workspace@pdg.lbl.gov)**

- Starting point for PDG collaborators, login in <https://pdgprod.lbl.gov/PdgWorkspace> and encoding instructions at [pdgprod.lbl.gov/twiki/bin/view/Pdg/PdgEncodingInstructions](https://pdgprod.lbl.gov/twiki/bin/view/Pdg/PdgEncodingInstructions)
- Each person requires a login via their email address used by PDG
- Encoding procedures: (Recap for new users)
  - Go to [pdg.lbl.gov](http://pdg.lbl.gov), Click “About PDG” and “Encode Tools” or go direct to <http://pdg.lbl.gov/rpp/encoders/contents.html>
  - Click “Particle Listings under Revision” to find list of particles
  - For example, click “Bottom Mesons” to find list of B mesons
  - Click  $B^+ S041.pdf$  and on right side of pages: **listed node names and DESIG**
    - Each decay has DESIG=xx number to be ordered in list
    - Each node has unique name on right side: S041S95
    - See next page for examples.
    - Useful to identify the node name and desig code before encoding .

• Decay Modes are ordered via DESIG and each branching ratio has Node name

\Gamm is dynamic generated not useful

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Scale factor/ Confidence level
<b>Semileptonic and leptonic modes</b>		
$\Gamma_1$ $l^+ \nu_l$ anything	[a] ( 10.99 ± 0.28 ) %	NODE=S041;CLUMP=A DESIG=220
$\Gamma_2$ $e^+ \nu_e X_c$	( 10.8 ± 0.4 ) %	DESIG=473
$\Gamma_3$ $D l^+ \nu_l$ anything	( 9.8 ± 0.7 ) %	DESIG=485
$\Gamma_4$ $\bar{D}^0 l^+ \nu_l$	[a] ( 2.27 ± 0.11 ) %	DESIG=145
$\Gamma_5$ $\bar{D}^0 \tau^+ \nu_\tau$	( 7.7 ± 2.5 ) × 10 <sup>-3</sup>	DESIG=498
$\Gamma_6$ $\bar{D}^*(2007)^0 l^+ \nu_l$	[a] ( 5.69 ± 0.19 ) %	DESIG=146
$\Gamma_7$ $\bar{D}^*(2007)^0 \tau^+ \nu_\tau$	( 1.88 ± 0.20 ) %	DESIG=499
$\Gamma_8$ $D^- \pi^+ l^+ \nu_l$	( 4.2 ± 0.5 ) × 10 <sup>-3</sup>	DESIG=418

Indent means sub-decay channel

$\Gamma(\bar{D}^0 \tau^+ \nu_\tau) / \Gamma_{\text{total}}$   $\Gamma_5/\Gamma$

VALUE (units 10<sup>-2</sup>)      DOCUMENT ID      TECN      COMMENT

**0.77 ± 0.22 ± 0.12**      1 BOZEK      10      BELL       $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.67 ± 0.37 ± 0.13      2 AUBERT      08N      BABR      Repl. by AUBERT 09s

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

NODE=S041C01  
NODE=S041C01

NODE=S041C01;LINKAGE=EP  
NODE=S041C01;LINKAGE=AU

$\Gamma(\bar{D}^0 \tau^+ \nu_\tau) / \Gamma(\bar{D}^0 l^+ \nu_l)$   $\Gamma_5/\Gamma_4$

VALUE      DOCUMENT ID      TECN      COMMENT

**0.429 ± 0.082 ± 0.052**      1,2 LEES      12D      BABR       $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.314 ± 0.170 ± 0.049      1 AUBERT      09s      BABR      Repl. by LEES 12D

<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

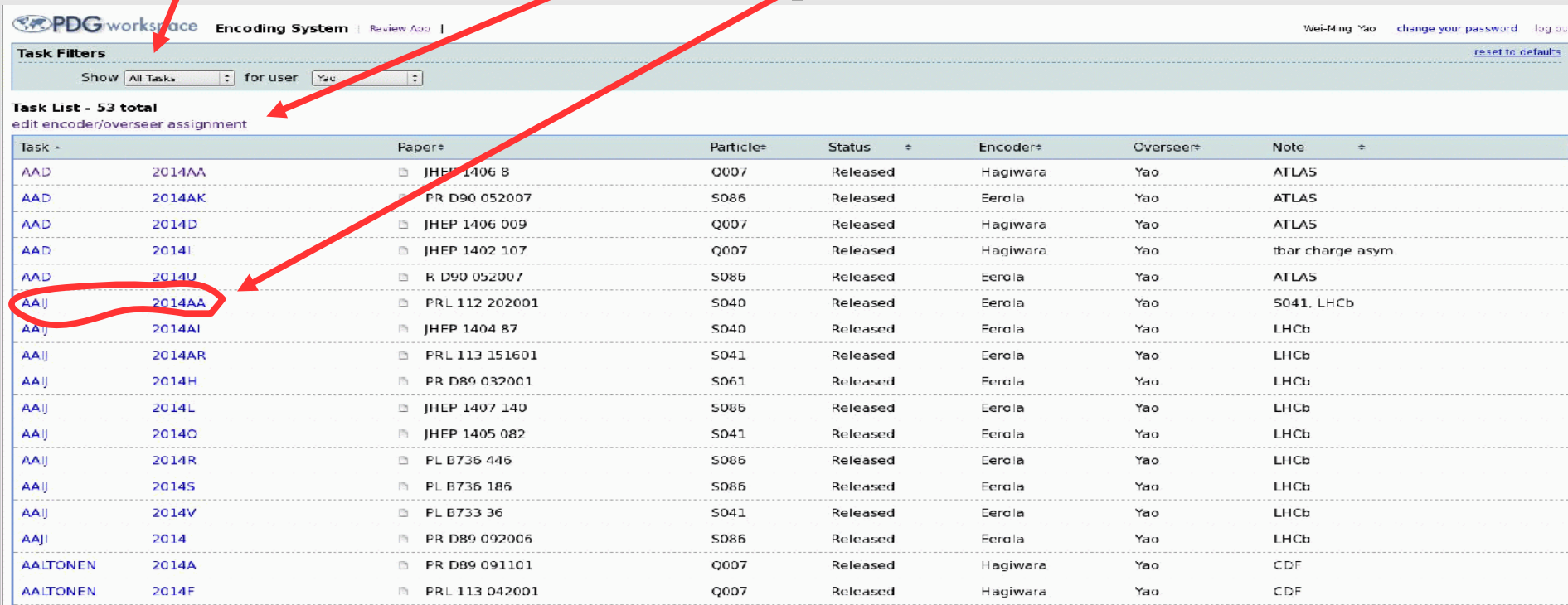
<sup>2</sup> Uses  $\tau^+ \rightarrow e^+ \nu_e \bar{\nu}_\tau$  and  $\tau^+ \rightarrow \mu^+ \nu_\mu \bar{\nu}_\tau$  and  $e^+$  or  $\mu^+$  as  $l^+$ .

NODE=S041C52  
NODE=S041C52

NODE=S041C52;LINKAGE=AU  
NODE=S041C52;LINKAGE=LE

• Each person requires login to PdgWorkspace

- click “All tasks” to see list of assigned papers.
- If there are unsigned papers, click “edit encoder/overseer assignments” to claim your papers to be encoded
- To encode AAIJ 2014AA for example



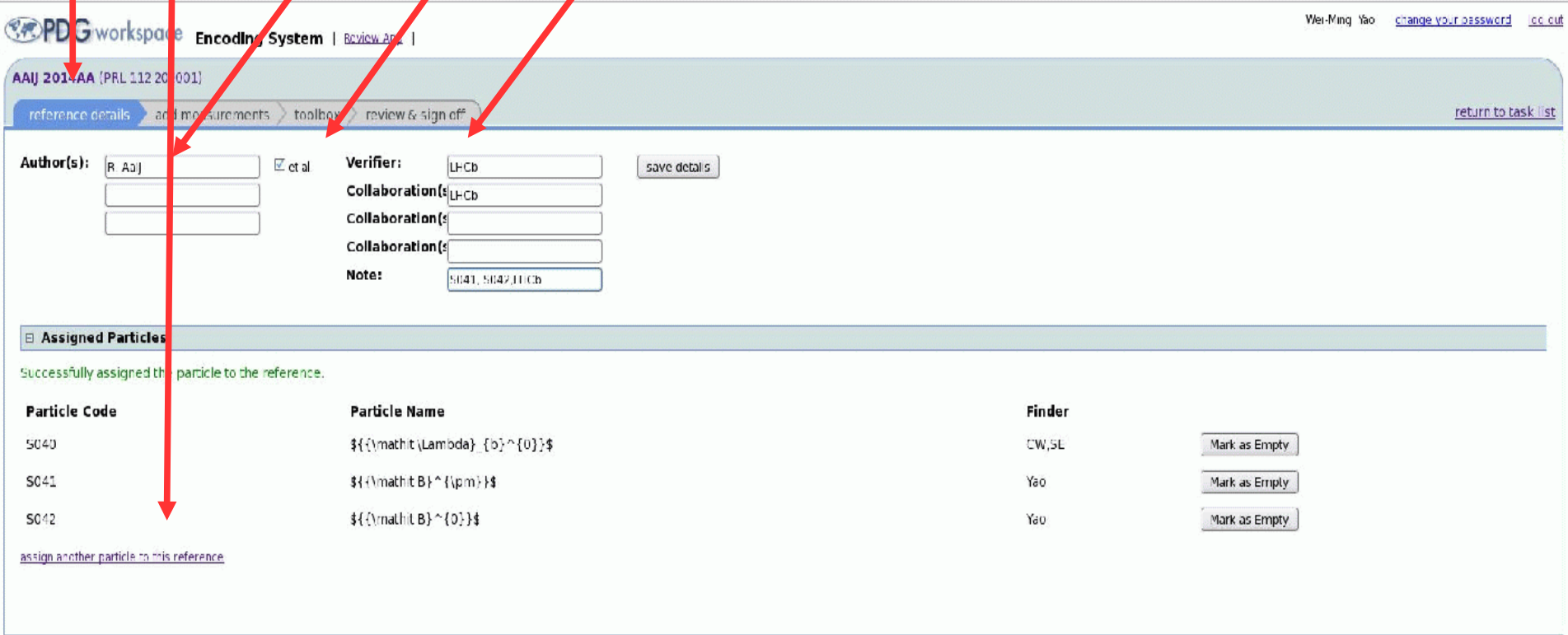
PDGworkspace Encoding System | Review App | Wei-Ming Yao | change your password | log out | reset to defaults

Task Filters: Show All Tasks for user You

Task List - 53 total  
edit encoder/overseer assignment

Task	Paper	Particle	Status	Encoder	Overseer	Note
AAJ	2014AA	JHEP 1406 B	Released	Hagiwara	Yao	ATLAS
AAJ	2014AK	PR D90 052007	Released	Eerola	Yao	ATLAS
AAJ	2014D	JHEP 1406 009	Released	Hagiwara	Yao	ATLAS
AAJ	2014I	JHEP 1402 107	Released	Hagiwara	Yao	thor charge asym.
AAJ	2014U	R D90 052007	Released	Eerola	Yao	ATLAS
AAIJ	2014AA	PRL 112 202001	Released	Eerola	Yao	S041, LHCB
AAJ	2014AI	JHEP 1404 87	Released	Eerola	Yao	LHCb
AAJ	2014AR	PRL 113 151601	Released	Eerola	Yao	LHCb
AAJ	2014H	PR D89 032001	Released	Eerola	Yao	LHCb
AAJ	2014L	JHEP 1407 140	Released	Eerola	Yao	LHCb
AAJ	2014C	JHEP 1405 082	Released	Eerola	Yao	LHCb
AAJ	2014R	PL B736 446	Released	Eerola	Yao	LHCb
AAJ	2014S	PL B736 186	Released	Eerola	Yao	LHCb
AAJ	2014V	PL B733 36	Released	Eerola	Yao	LHCb
AAJ	2014	PR D89 092006	Released	Eerola	Yao	LHCb
AAJTONEN	2014A	PR D89 091101	Released	Hagiwara	Yao	CDF
AAJTONEN	2014F	PRL 113 042001	Released	Hagiwara	Yao	CDF

- **Click “Add reference”**
- **Filling first author name et al, Verifier, Collaboration, Note**
- **Click “assign another particle to the reference if there is more, then click task list to assign the extra assigned particles to the corresponding encoder/overseer.**



PDG workspace | Encoding System | Review Article | Wei-Ming Yao | [change your password](#) | [log out](#)

AAIJ 2014AA (PRL 112 20 001)

reference details | add measurements | toolbox | review & sign off | [return to task list](#)

**Author(s):** [ R Aaij ]  et al

**Verifier:** [ LH-Cb ]

**Collaboration(s):** [ LH-Cb ]

**Collaboration(s):** [ ]

**Collaboration(s):** [ ]

**Note:** [ S041, S042, LH-Cb ]

**Assigned Particles**

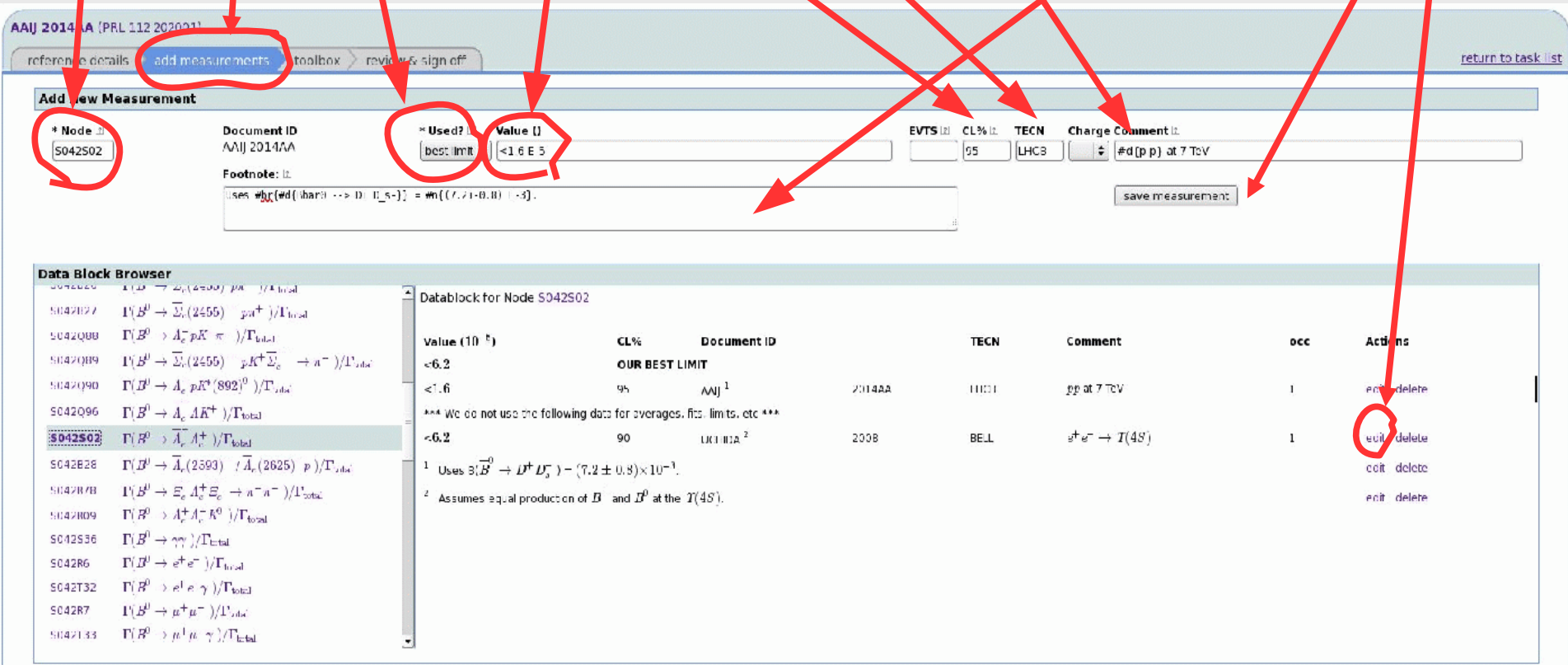
Successfully assigned the particle to the reference.

Particle Code	Particle Name	Finder	
S040	$\lambda_{0}^{(0)}$	CW,SE	<input type="button" value="Mark as Empty"/>
S041	$B^{(pm)}$	Yao	<input type="button" value="Mark as Empty"/>
S042	$B^{(0)}$	Yao	<input type="button" value="Mark as Empty"/>

[assign another particle to this reference](#)



- Click **“Add measurement”**: Node=S042S02 (B0->\Lambda\_c^+\Lambda\_c^-)
- **Filling Node, Best Limit, Value, CL, TECH, Comments, footnote, then “save”**
- If the measurement is the best limit, we have to edit existing one, set **“not used”**.



AAIJ 2014 AA (PRL 112 202001)

reference details **add measurements** toolbox review & sign off [return to task list](#)

**Add New Measurement**

\* Node ID: S042S02

Document ID: AAIJ 2014AA

\* Used? best limit

Value (10<sup>-5</sup>): <1.6 E 5

EVTS (1):

CL% (1): 95

TECN: LHCB

Charge Comment (1): #d [p p] at 7 TeV

Footnote (1): Uses  $\mathcal{B}(B^0 \rightarrow D^+ D_s^-) = \mathcal{B}(D^+ D_s^-) \times 3$ .

save measurement

**Data Block Browser**

Datablock for Node S042S02

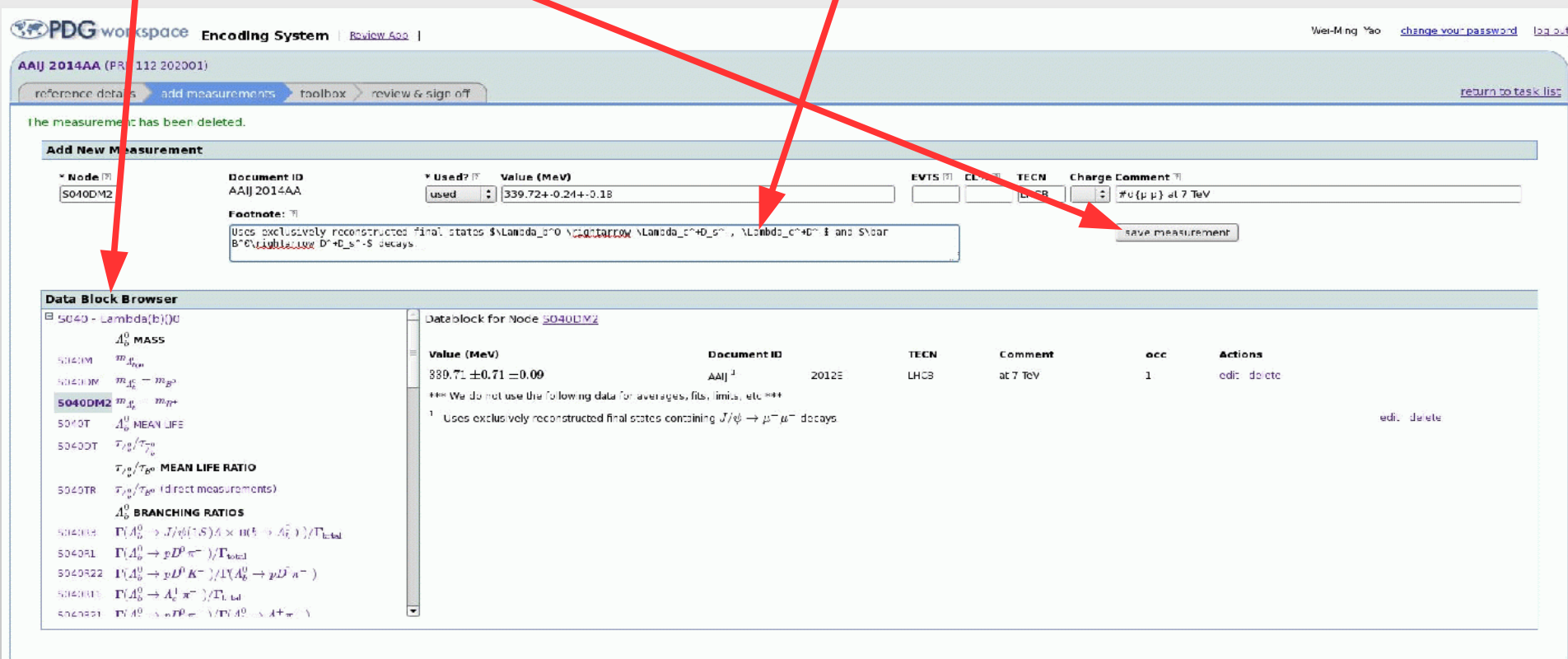
Value (10 <sup>-5</sup> )	CL%	Document ID	TECN	Comment	occ	Actions
<6.2	OUR BEST LIMIT					
<1.6	95	AAIJ 2014AA	LHCB	#p at 7 TeV	1	edit delete
<6.2	90	LHCb 2012A 2	BEL	$e^+e^- \rightarrow T(4S)$	1	edit delete

1 Uses  $\mathcal{B}(B^0 \rightarrow D^+ D_s^-) = (7.2 \pm 0.8) \times 10^{-1}$ .

2 Assumes equal production of  $D^+$  and  $D^0$  at the  $T(4S)$ .

• Look up the corresponding node from the full data listing (s041.pdf or s042.pdf), which is more efficient when there are couple hundred decays or Data Block Browsers below.

• Do encoding below and save. Using latex for footnote and comment is acceptable.



The measurement has been deleted.

**Add New Measurement**

\* Node: S040DM2    Document ID: AAIJ 2014AA    \* Used?: used    Value (MeV): 339.724 ± 0.24 ± 0.18    EVTS:    CL:    TECN: LHCb    Charge Comment:  $\mu^+\mu^-$  at 7 TeV

Footnote: Uses exclusively reconstructed final states containing  $J/\psi \rightarrow \mu^+\mu^-$  decays

**Data Block Browser**

5040 - Lambda(b)0

Node	Value (MeV)	Document ID	TECN	Comment	occ	Actions	
S040M	$m_{\Lambda_b^0}$	AAIJ <sup>1</sup>	2012E	LHCb	at 7 TeV	1	edit delete
S040DM	$m_{\Lambda_b^0} - m_{p^0}$						
S040DM2	$m_{\Lambda_b^0} - m_{p^+}$						
S040T	$\Lambda_b^0$ MEAN LIFE						
S040DT	$\tau_{\Lambda_b^0}/\tau_{p^0}$						
	$\tau_{\Lambda_b^0}/\tau_{p^0}$ MEAN LIFE RATIO						
S040TR	$\tau_{\Lambda_b^0}/\tau_{p^0}$ (direct measurements)						
	$\Lambda_b^0$ BRANCHING RATIOS						
S040B	$\Gamma(\Lambda_b^0 \rightarrow J/\psi(\rightarrow S)\Lambda + \text{h.c.} \rightarrow \Lambda_b^0) / \Gamma_{\text{total}}$						
S040B1	$\Gamma(\Lambda_b^0 \rightarrow pD^0\pi^-) / \Gamma_{\text{total}}$						
S040B2	$\Gamma(\Lambda_b^0 \rightarrow pD^0K^-) / \Gamma(\Lambda_b^0 \rightarrow pD^0\pi^-)$						
S040B3	$\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-) / \Gamma_{\text{total}}$						
S040B4	$\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^0) / \Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-)$						

\*\*\* We do not use the following data for averages, fits, limits, etc \*\*\*

<sup>1</sup> Uses exclusively reconstructed final states containing  $J/\psi \rightarrow \mu^+\mu^-$  decays

• Some case, a ratio of branching ratio is measured, for example,  
 $B(B_s \rightarrow D^+ D_s^-) / B(B^0 \rightarrow D^+ D_s^-) = 0.038 \pm 0.004 \pm 0.003$ .

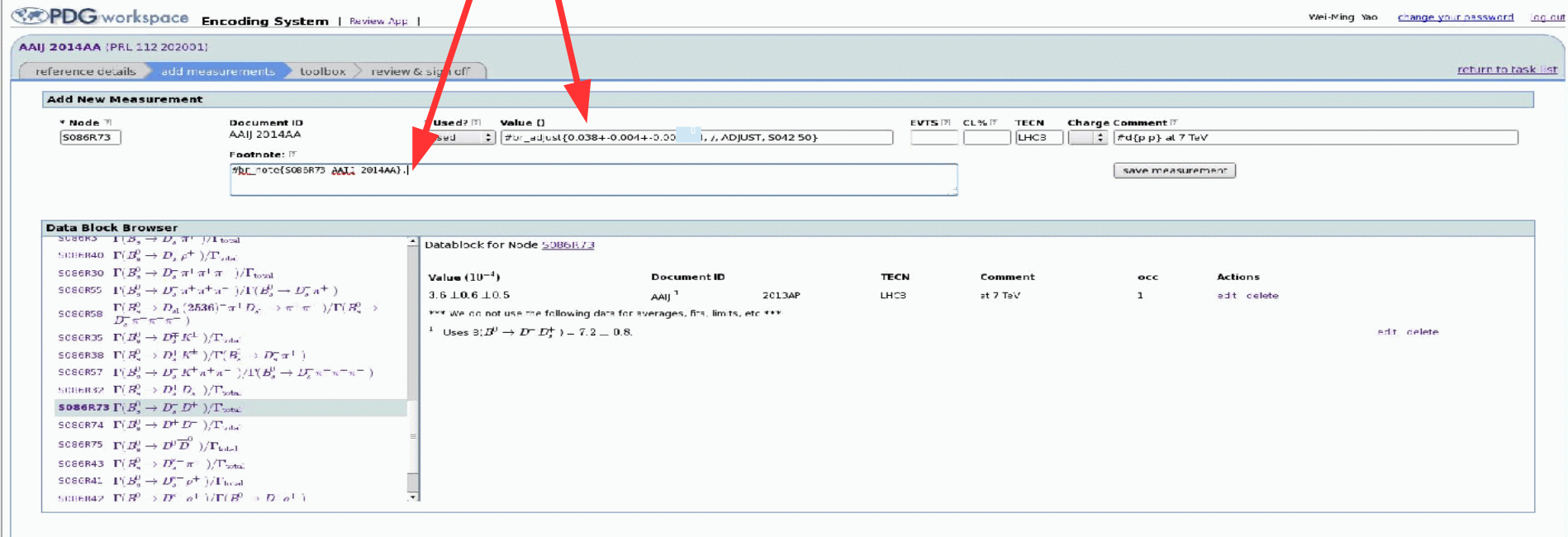
• PDG uses br\_adjust to rescale  $B(B_s \rightarrow D^+ D_s^-)$  properly when the value of  $B(B^0 \rightarrow D^+ D_s^-)$  could change in future. The syntax are below:

DESIG for  $B^0 \rightarrow D^+ D_s^-$

– Measurement: #br\_adjust{0.038+-0.004+-0.003; /, ADJUST, S042 50}

– Footnote: #br\_note{S086R73 AAIJ 2014AA}

/ for ratio; \* for product



The screenshot shows the PDG workspace interface. At the top, there's a navigation bar with 'reference details', 'add measurements', 'toolbox', and 'review & sign off'. Below this is the 'Add New Measurement' form. The 'Node' field is set to 'S086R73'. The 'Document ID' is 'AAIJ 2014AA'. The 'Value' field contains the syntax: '#br\_adjust{0.038+-0.004+-0.003; /, ADJUST, S042 50}'. The 'Footnote' field contains: '#br\_note{S086R73 AAIJ 2014AA}'. There are also fields for 'EVTS', 'CL%', 'TECN' (set to 'LHC3'), and 'Charge'. A 'save measurement' button is visible.

Below the form is the 'Data Block Browser'. It shows a list of data blocks for Node S086R73. The selected block is S086R73, which has a value of  $3.6 \pm 0.6 \pm 0.5$  (in units of  $10^{-4}$ ), document ID 'AAIJ', TECN 'LHC3', and comment 'at 7 TeV'. The browser also shows other blocks like S086R40, S086R30, S086R55, S086R58, S086R35, S086R38, S086R57, S086R52, S086R74, S086R75, S086R43, S086R41, and S086R42.



- Creating new decay is not recommended for B+, and B0 (ask overseer and Piotr for it).
  - Select particle, browser list decays locating where to put new decay.
  - Drag particles on the right box to form the decay chain and save it
- Creating Branch ratios:
  - Browser Branching ratios node to locate where to put and decide ratio or BR
  - Drag decays on the right side into the box and save it.

Particle Selector: B(s)0

Decay mode selector

53:  $B_s^0 \rightarrow A_s^+ \pi^-$

54:  $B_s^0 \rightarrow A_s^0 \pi^-$

55:  $B_s^0 \rightarrow A_s^+ \pi^0$

56:  $B_s^0 \rightarrow A_s^0 \pi^0$

57:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^-$

58:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^-$

59:  $B_s^0 \rightarrow A_s^+ \pi^0 \pi^0$

60:  $B_s^0 \rightarrow A_s^0 \pi^0 \pi^0$

61:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^0$

62:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^0$

63:  $B_s^0 \rightarrow A_s^+ \pi^0 \pi^0$

64:  $B_s^0 \rightarrow A_s^0 \pi^0 \pi^0$

65:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^+$

66:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^+$

67:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^0$

68:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^0$

69:  $B_s^0 \rightarrow A_s^+ \pi^0 \pi^0$

70:  $B_s^0 \rightarrow A_s^0 \pi^0 \pi^0$

71:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^+$

72:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^+$

73:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^0$

74:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^0$

75:  $B_s^0 \rightarrow A_s^+ \pi^0 \pi^0$

76:  $B_s^0 \rightarrow A_s^0 \pi^0 \pi^0$

77:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^+$

78:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^+$

79:  $B_s^0 \rightarrow A_s^+ \pi^+ \pi^0$

80:  $B_s^0 \rightarrow A_s^0 \pi^+ \pi^0$

81:  $B_s^0 \rightarrow A_s^+ \pi^0 \pi^0$

82:  $B_s^0 \rightarrow A_s^0 \pi^0 \pi^0$

Particle Selector: B(s)0

branching ratios

68:  $\Gamma(B_s^0 \rightarrow K^+ K^+ K^-) / \Gamma_{total}$

69:  $\Gamma(B_s^0 \rightarrow K^+ K^0 K^0) / \Gamma_{total}$

70:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0) / \Gamma_{total}$

71:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0) / \Gamma_{total}$

72:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^+ \pi^-) / \Gamma_{total}$

73:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^+ \pi^-) / \Gamma_{total}$

74:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0 \pi^0) / \Gamma_{total}$

75:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0 \pi^0) / \Gamma_{total}$

76:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^+ \pi^0) / \Gamma_{total}$

77:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^+ \pi^0) / \Gamma_{total}$

78:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0 \pi^0) / \Gamma_{total}$

79:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0 \pi^0) / \Gamma_{total}$

Particle Selector: B(s)0

branching ratios for B(s)0

68:  $\Gamma(B_s^0 \rightarrow K^+ K^+ K^-) / \Gamma_{total}$

69:  $\Gamma(B_s^0 \rightarrow K^+ K^0 K^0) / \Gamma_{total}$

70:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0) / \Gamma_{total}$

71:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0) / \Gamma_{total}$

72:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^+ \pi^-) / \Gamma_{total}$

73:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^+ \pi^-) / \Gamma_{total}$

74:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0 \pi^0) / \Gamma_{total}$

75:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0 \pi^0) / \Gamma_{total}$

76:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^+ \pi^0) / \Gamma_{total}$

77:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^+ \pi^0) / \Gamma_{total}$

78:  $\Gamma(B_s^0 \rightarrow K^+ K^+ \pi^0 \pi^0) / \Gamma_{total}$

79:  $\Gamma(B_s^0 \rightarrow K^+ K^0 \pi^0 \pi^0) / \Gamma_{total}$

**Finished and go back to add measurement !**

- Click “Review to sign off” will show you all the encoding for the paper so far
- Click “review RPP” shows pdf file and edit to correcting any mistakes
- Be careful: measurement used or not, add comments “Repl. By ...”. final sign off

PDG workspace Encoding System | Review 400 |

Wei-Ming Yao | change your password | log out

AAJ 2014AA (PRL 112 202001)

reference details | add measurements | toolbox | review & sign off | return to task list

**Sign off Encodings**

**Reference Details**

Reference	Authors	Collaboration
AAJ 2014AA (PRL 112 202001)	et al, R. Aaij	LHCb

**New Measurements for S040**

Node	Document ID	Used?	Value	EVTS	CL%	TECN	Comment	edit	view rpp for
1) <a href="#">S040R25</a>	AAJ 2014AA	used	0.042 ± 0.003 ± 0.003			LHCb	#d{p p} at 7 TeV	<a href="#">edit</a>	<a href="#">view rpp for S040R25</a>
2) <a href="#">S040R24</a>	AAJ 2014AA <sup>1</sup>	used	1.1 ± 0.1 E-2			LHCb	#d{p p} at 7 TeV	<a href="#">edit</a>	<a href="#">view rpp for S040R24</a>
1: Uses $B(\bar{B}^0 \rightarrow D^+ D_s^-) = (7.2 \pm 0.8) \times 10^{-3}$ and their measured $B(\Lambda_b^+ \rightarrow \Lambda_c^+ \pi^-) / B(\bar{B}^0 \rightarrow D^+ \pi^-)$ values.									
3) <a href="#">S040DM2</a>	AAJ 2014AA <sup>1</sup>	used	339.72 ± 0.24 ± 0.18 MeV			LHCb	#d{p p} at 7 TeV	<a href="#">edit</a>	<a href="#">view rpp for S040DM2</a>
1: Uses exclusively reconstructed final states $\Lambda_b^0 \rightarrow \Lambda_c^+ D_s^-$ , $\Lambda_c^+ D_s^-$ and $\bar{B}^0 \rightarrow D^+ D_s^-$ decays.									
4) <a href="#">S040M</a>	AAJ 2014AA <sup>1</sup>	used	5619.30 ± 0.34 MeV			LHCb	#d{p p} at 7 TeV	<a href="#">edit</a>	<a href="#">view rpp for S040M</a>
1: Uses exclusively reconstructed final states $\Lambda_b^0 \rightarrow \Lambda_c^+ D_s^-$ , $\Lambda_c^+ D_s^-$ and $\bar{B}^0 \rightarrow D^+ D_s^-$ decays. The uncertainty includes both statistical and systematic contributions.									

**Other Measurements From This Paper**

Node	Document ID	Used?	Value	EVTS	CL%	TECN	Comment
S042	AAJ 2014AA	used					

- **Some parts of encoding are still not working friendly**
- **About half of encoders and overseers have used the new system for RPP2014**
- **We encourage every encoder to try out the new system early, do not wait for the last minutes.**
- **It will take you some time in the beginning, but let us know if you have any problems.**
- **Once familiar with the system, the encoding efficiency will improve.**