

How to display result

- The documentation of results in PDG has improved

Old

$$\Delta m_{B^0} = m_{B_H^0} - m_{B_L^0}$$

Δm_{B^0} is a measure of 2π times the $B^0 - \bar{B}^0$ oscillation frequency in time-dependent mixing experiments.

“OUR EVALUATION” is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFLAV) and are described at <https://hflav.web.cern.ch/>. The averaging/rescaling procedure takes into account correlations between the measurements and includes Δm_d calculated from χ_d measured at $\Upsilon(4S)$.

VALUE (10^{12} h s^{-1})	DOCUMENT ID
0.5065 ± 0.0019 OUR EVALUATION	
0.5050 ± 0.0021 ± 0.0010	¹ AAJ 2016AV
0.503 ± 0.011 ± 0.013	² AAJ 2013CF
0.5156 ± 0.0051 ± 0.0033	³ AAJ 2013F

New

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VALUE (10^{12} h s^{-1})	DOCUMENT ID	TECN	COMMENT
0.5069 ± 0.0019 OUR EVALUATION (Produced by HFLAV)			
0.516 ± 0.008 ± 0.005	¹ ABUDINEN	2023D BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.5050 ± 0.0021 ± 0.0010	² AAJ	2016AV LHCB	pp at 7, 8 TeV
0.503 ± 0.011 ± 0.013	³ AAJ	2013CF LHCB	pp at 7 TeV

How to display result

- Link is still just to HFLAV webpage
 - Often many clicks away from a web page that gives the background to the result
 - Sometimes there is in fact nowhere to find the information about which papers were used, which theory parameters etc.

$\Delta m_{B^0} = m_{B^0} - m_{\bar{B}^0}$ PDGID: S042D [INSPIRE](#)

Δm_{B^0} is a measure of 2π times the $B^0 - \bar{B}^0$ oscillation frequency in time-dependent mixing experiments.

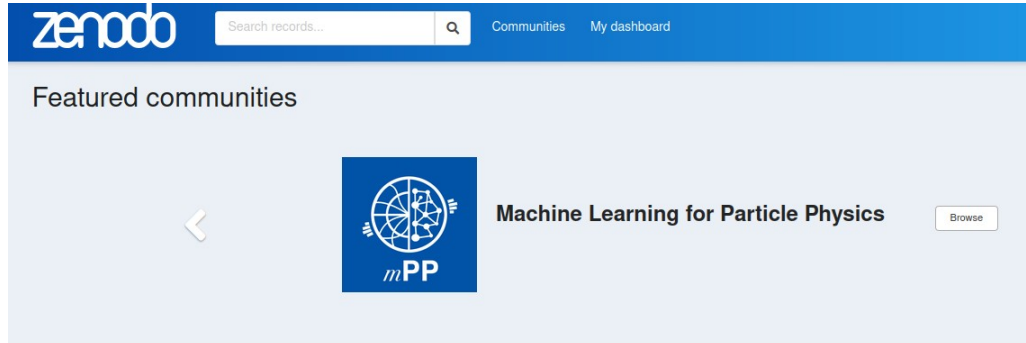
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Making HFLAV FAIR

- From a purely scientific point of view it is unsatisfactory that specific HFLAV results are often hard to find full and accurate documentation for
- The steering group of the PDG has in addition made it clear that this situation is not acceptable if HFLAV is to continue to provide results for the PDG
 - PDG has itself made huge improvements in this area
- The principles we should aim for are encapsulated in the acronym “FAIR”

An explainer: Zenodo



- A digital repository that allows for the update of nearly any type of data.

Recent uploads

January 15, 2025 (v47) Dataset Open

Processed JUMP Datasets: For Web and programmatic exploration.

Alán F. Muñoz

This dataset provides multiple tables for JUMP exploration:- Full datasets contain precomputed analysis:- significance - is the phenotypic activity of a given value (see [broad.io/crispr_feature](#) for a formal definition), while distance contains the cosine distance of all perturbations vs all other perturbations within a given dataset.- The...

Uploaded on January 15, 2025

Part of Broad Institute Imaging Platform

46 more versions exist for this record

1484 5639

About Zenodo

Passionate about Open Science!

Built and developed by researchers, to ensure that everyone can join in Open Science.

The OpenAIRE project, in the vanguard of the open access and open data movements in Europe was commissioned by the EC to support their nascent Open Data policy by providing a catch-all repository for EC funded research. CERN, an OpenAIRE partner and pioneer in open source, open access and open data, provided this capability and Zenodo was launched in May 2013.

In support of its research programme CERN has developed tools for Big Data management and extended Digital Library capabilities for Open Data. Through Zenodo these Big Science tools could be effectively shared with the long-tail of research.

Making HFLAV FAIR

- The **FAIR principle** implies that research should be:
- **F**indable
 - F1. (Meta)data are assigned a globally unique and persistent identifier
 - F2. Data are described with rich metadata (defined by R1 below)
 - F3. Metadata clearly and explicitly include the identifier of the data they describe
 - F4. (Meta)data are registered or indexed in a searchable resource
- **We can do this by registering individual (groups of) results in Zenodo where they will get a persistent DOI**

Making HFLAV FAIR

- The **FAIR principle** implies that research should be:
- **A**ccessible
 - A1. (Meta)data are retrievable by their identifier using a standardised communications protocol
 - A1.1 The protocol is open, free, and universally implementable
 - A1.2 The protocol allows for an authentication and authorisation procedure, where necessary
 - A2. Metadata are accessible, even when the data are no longer available
- **Zenodo gives us all this for free**

Making HFLAV FAIR

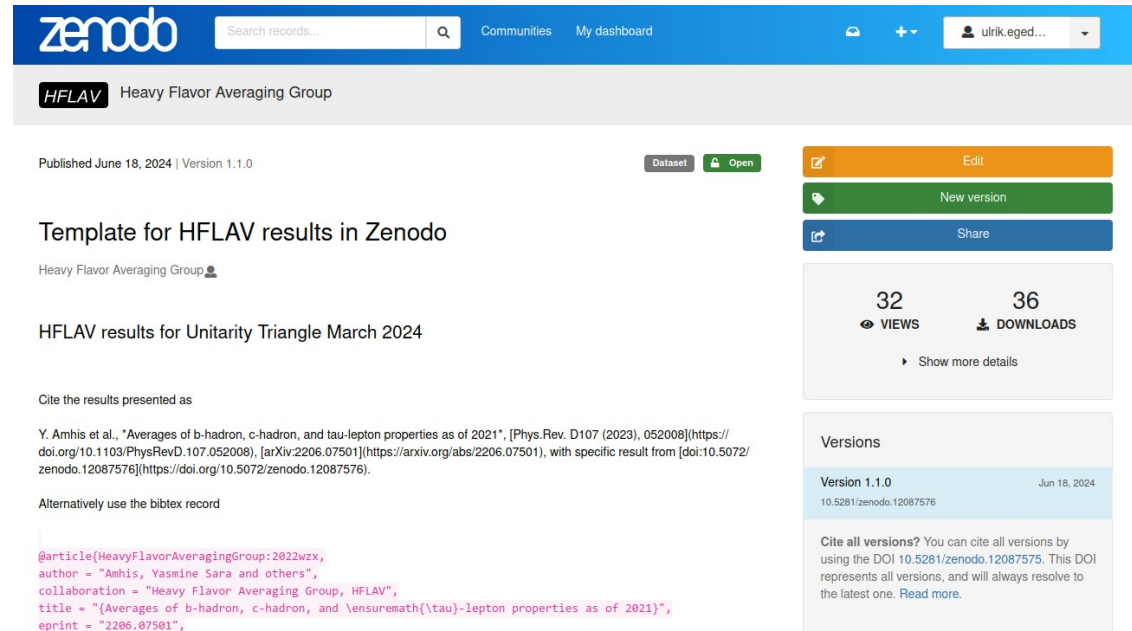
- The **FAIR principle** implies that research should be:
- **I**nteroperable
 - I1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
 - I2. (Meta)data use vocabularies that follow FAIR principles
 - I3. (Meta)data include qualified references to other (meta)data
- **The use of JSON files is a good choice here and matches up with what the PDG is doing**

Making HFLAV FAIR

- The **FAIR principle** implies that research should be:
- **R**eusable
 - R1. (Meta)data are richly described with a plurality of accurate and relevant attributes
 - R1.1. (Meta)data are released with a clear and accessible data usage license
 - R1.2. (Meta)data are associated with detailed provenance
 - R1.3. (Meta)data meet domain-relevant community standards
- **The CC-BY-4 licence is good for this but we need to do better on software availability and documentation**

Gitlab CI for publishing results to Zenodo

- A [template](#) has been created to show how this is done
- Template can be forked for an individual set of measurements
- Upload to Zenodo works by simply creating a new “release” in Gitlab



The screenshot shows the Zenodo interface for a dataset titled "Template for HFLAV results in Zenodo" by the Heavy Flavor Averaging Group. The page includes a search bar, navigation links for "Communities" and "My dashboard", and a user profile for "ulrik.eged...". The dataset is published on June 18, 2024, at version 1.1.0. It has 32 views and 36 downloads. The main content area displays the title, author information, and a citation for the dataset. A sidebar on the right contains buttons for "Edit", "New version", and "Share", along with a "Versions" section showing the current version 1.1.0.

zenodo Search records... Communities My dashboard ulrik.eged...

HFLAV Heavy Flavor Averaging Group

Published June 18, 2024 | Version 1.1.0 Dataset Open

Template for HFLAV results in Zenodo

Heavy Flavor Averaging Group

HFLAV results for Unitarity Triangle March 2024

Cite the results presented as

Y. Amhis et al., "Averages of b-hadron, c-hadron, and tau-lepton properties as of 2021", [Phys.Rev. D107 (2023), 052008][https://doi.org/10.1103/PhysRevD.107.052008], [arXiv:2206.07501][https://arxiv.org/abs/2206.07501], with specific result from [doi:10.5072/zenodo.12087576][https://doi.org/10.5072/zenodo.12087576].

Alternatively use the bibtex record

```
@article{HeavyFlavorAveragingGroup:2022wzx,  
author = "Amhis, Yasmine Sara and others",  
collaboration = "Heavy Flavor Averaging Group, HFLAV",  
title = "(Averages of b-hadron, c-hadron, and \ensuremath{\tau}-lepton properties as of 2021)",  
eprint = "2206.07501",
```

32 VIEWS 36 DOWNLOADS Show more details

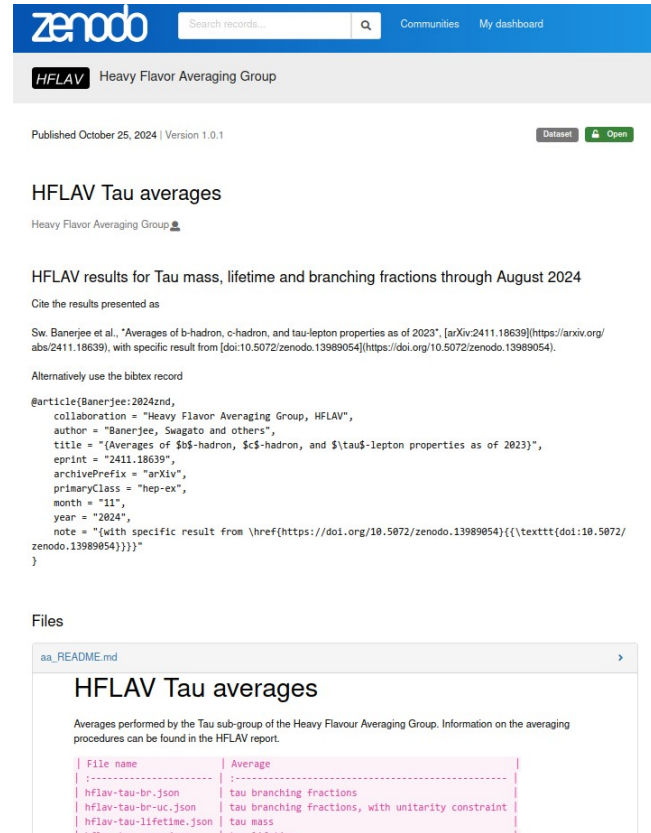
Versions

Version 1.1.0 Jun 18, 2024
10.5281/zenodo.12087576

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.12087575. This DOI represents all versions, and will always resolve to the latest one. Read more.

Use so far

- The tau results for the latest write-up has been uploaded here as [doi:10.5072/zenodo.13989054](https://doi.org/10.5072/zenodo.13989054)
- Specific tau results can be cited as Sw. Banerjee et al., Averages of b-hadron, c-hadron, and tau-lepton properties as of 2023, [arXiv:2411.18639], with specific result from [doi:10.5072/zenodo.13989054](https://doi.org/10.5072/zenodo.13989054).
- No more “... and updates from web page” citations



The screenshot shows the Zenodo repository page for the HFLAV Tau averages dataset. The page title is "HFLAV Heavy Flavor Averaging Group". It was published on October 25, 2024, and is version 1.0.1. The page content includes the title "HFLAV Tau averages", the author "Heavy Flavor Averaging Group", and a description: "HFLAV results for Tau mass, lifetime and branching fractions through August 2024". It provides citation information and a BibTeX record. The BibTeX record is as follows:

```
@article{Banerjee:2024znd,
  collaboration = "Heavy Flavor Averaging Group, HFLAV",
  author = "Banerjee, Swagato and others",
  title = "[Averages of B-hadron, C-hadron, and tau-lepton properties as of 2023]",
  eprint = "2411.18639",
  archivePrefix = "arXiv",
  primaryClass = "hep-ex",
  month = "11",
  year = "2024",
  note = "[with specific result from \href{https://doi.org/10.5072/zenodo.13989054}{\texttt{doi:10.5072/zenodo.13989054}}]"
}
```

Below the BibTeX record, there is a "Files" section showing a file named "aa_README.md". The file content is a README for the HFLAV Tau averages, which includes a table of files and their averages:

File name	Average
hflav-tau-br.json	tau branching fractions
hflav-tau-br-uc.json	tau branching fractions, with unitarity constraint
hflav-tau-lifetime.json	tau mass

Work to do

- Refinement of JSON format used for specifying results
- Plugins written to fitting code that allows results to be created in this format without manual editing
- Validator of json files to be created to ensure consistency