PDG Meson Team

Simon Eidelman

BINP, Novosibirsk and LPI, Moscow

Outline

1. Team/responsibilities
2. Activities for RPP2020
3. Problems
4. Conclusions

Meson Team

Person	Affiliation	Responsibilities
Claude Amsler	Vienna	Literature, encoding
Michael Doser	CERN	Management, encoding
Simon Eidelman	Novosibirsk	Literature, encoding
Thomas Gutsche	Tübingen	Theory, encoding
Christoph Hanhart	Julich	Theory, encoding
Juan-Jose Hernández-Rey	Valencia	Encoding
Carlos Lourenco	CERN	Encoding
Alberto Masoni	Cagliari	Encoding
Mikhail Mikhasenko	CERN	Encoding
Ryan Mitchell	Bloomington	Encoding
Sergio Navas	Granada	$c\bar{c}$ fit, encoding
Claudia Patrignani	Bologna	$c\bar{c}$ fit, encoding
Stefan Spanier	Knoxville	Encoding
Graziano Venanzoni	Pisa	Encoding
Vitaly Vorobyev	Novosibirsk	Encoding

Responsibilities

- We are all "encoders" and "overseers" (LBNL terminology) for unstable mesons decaying via strong interactions
- In addition, everybody takes care of specific J^{PC} (vectors, scalars, heavy quark, ... states)
- We are authors and reviewers of our minireviews, therefore have to consider also papers on theory/phenomenology
- Regular monthly meetings to discuss current business
- Regular meetings at CERN twice a year for "global" decisions
- CA and SE – coordinators

Activities for RPP20

- 119 papers selected (247 in 2018, 217 in 2016)
- 164 (322, 572) new measurements:
  - 38 (83, 107) light unflavored mesons
  - 8 (26, 6) strange mesons
  - 0 (1, 18) charmed mesons
  - 1 (0, 73) beauty mesons
  - 101 (197, 240) $c\bar{c}$ mesons
  - 16 (15, 81) $b\bar{b}$ mesons
- 14 minireviews and notes in the listings:
  (9 updated, 1 unchanged, 4 old hidden)
- The new naming scheme already needs to be extended
  to accommodate a new 6.9 GeV $(J/\psi\ J/\psi)$ state observed by LHCb

PAPERS SELECTED FOR THE 2020 RPP EDITION

Journal	All papers	Meson	MESON(EXP)	MESON(TH)
Phys.Rev.D	184	71	40	31
Phys.Rev.Lett.	82	8	7	1
JHEP	80	2	2	0
Phys.Lett.B	69	12	4	8
Eur.Phys.J.C	64	7	0	7
Others	34	19	1	18
Total	513	119	54	65

513 – the total number of papers selected
in the period February 2019 - January 2020

119 papers were selected and processed by the Meson Team:
54 - experiment encoded, 65 - theory/phenomenology

Problems

- Meson Team is learning new PDG software (great help of Piotr) and gradually moves to direct work with the database
- Serious cleaning of the listings is needed since many nodes show inconsistencies or are just obsolete caused by using old values of the intermediate branchings or just wrong info
- Should consistently combine isospin partners, successful example of merging eight B_J mesons into four
- For broad states move from Breit-Wigner parameters to T-matrix poles (like it was consistently done for the $f_0(500)$ and $K_0^*(700)$), $K^*(892)$ in progress, $\rho(770)$ expecting its turn
- New minireviews have been planned

Conclusions

- Still active field
- A smaller flow from BaBar and Belle,
  but BelleII started data taking in 2018
- BES-III provides a lot of info on $c\bar{c}$ from the huge samples of the J/ψ and $\psi(2S)$
  as well as on light mesons from the radiative decays of the J/ψ
- Steady flow of results on open-c(b) as well as $c\bar{c}$ states
  is coming from the LHC experiments
- Many papers on light mesons are expected from VEPP-2000 in Novosibirsk
  and COMPASS at CERN
- In the more distant future – Gluex (JLAB), PANDA (GSI)