



Authorship of HEP Publications

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Past Chair of the Commission of Particles and Fields *

International Union of Pure and Applied Physics

*) The organization supporting HEP worldwide, for instance, overseeing the ICHEP and LPS.



HEP Authorship : Common Current Practice

- In the past, the **larger HEP collaborations** have had **200 – 600 members**; this is **growing to 2000** for the large LHC experiments.
- Current policies for authorship of scientific papers reflect the high energy physics tradition that **detector design, construction, and operation is carried out by the same team of physicists that also performs the physics analyses**
- Thus, **publications are the outcome of joint efforts by the collaboration**, not just the few individual scientists who initiate and perform a specific analysis and prepare a publication.
- **Active members** who have contributed to the experiment for at least 6 to 12 months are **entitled to authorship**, practically all of them sign publications.



Working Group on Authorship Formed by C11

- In 2004/05, members of C11 posed the question:

What is the impact of growing Author Lists ?

- Do they appropriately credit those who have contributed most ?
 - Can we accept the fact that many of the authors are not very knowledgeable about the contents of their publications ?
 - How can readers identify and contact those most knowledgeable ?
 - What is the purpose and value of being an author ?
 - Do the individual publication and citation records remain important ?
- C11 formed a WG charged to
 - Examine current practices in HEP and other fields
 - Explore benefits and potential modifications and alternatives
 - Sample the opinion of the HEP community
 - Prepare a report to submit to C11 and make it widely available



C11 Working Group on Authorship

■ Members

C11 of IUPAP:

Gregor Herten
Vera Lüth (chair),
Steinar Stapnes,
Taku Yamanaka

Others:

Hiro Aihara	Belle
Lorenzo Foa	CMS
Jacques Chauveau	BABAR
Dmitri Denisov	D0
Hans-Ake Gustafsson	ALICE
Max Klein	H1/ZEUS
Pippa Wells	ATLAS
Jack Sandweiss	APS
Daniel Whiteson	CDF



Authorship and Types of Publications

- **Publications of physics analyses – All Members**
 - signed by all eligible members of the collaborations:
- **Contributions to conference proceedings – Single Author**
 - in the form of write-ups of an invited talk by an individual, usually representing the collaboration.
- **Scientific Notes – Few Selected Authors**
 - Most collaborations document physics analyses in great detail in internal reports prepared by a small group of scientists: LHC experiments hope to publish scientific notes in journals.
- **Technical publications - Few selected Authors**
 - covering detector design, construction and operation, as well as advances in electronics, data acquisition, computing and software
- In the following, we focus on journal publications of physics results based on shared data.



WG on Authorship : Common Current Practice

■ Questions:

- Should this practice be extended to Collaborations with 2000 scientists ?
- Does this form of collective authorship meet the APS rules for authorship, requiring significant contributions to justify authorship ?
- How do we define significant contributions ?
- If not via authorship, how else do we recognize individual contributions to physics analyses as well as technical innovation and support of operations ?

■ Who establishes the rules?

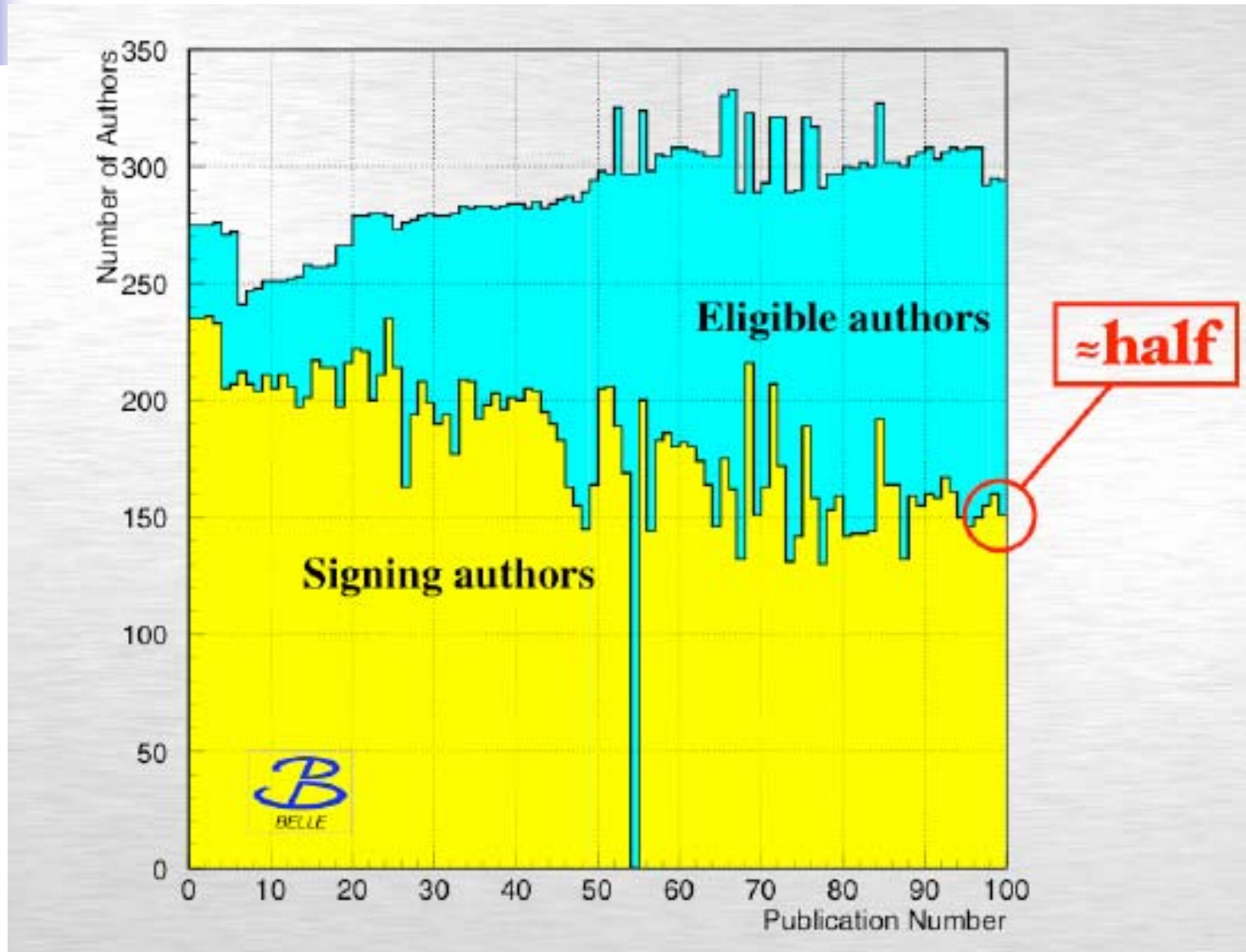
- Most collaborations have a governing body, a council and an executive board; younger scientists have very little participation
- The council establishes the rules, by decree they usually remain unchanged
- The tradition established by the LEP experiments carries over to the LHC.



1st Alternative: Belle Practice

- The Belle Collaboration
 - 300 scientists from 56 institutions in 13 countries
- Prior to the publication members of the collaboration need to request **authorship** by responding to the following:
Please include me in the author list: YES/NO
 - YES - I have read this paper and I agree with its contents
 - NO - I have read the paper, I do not agree with its contents
 - NO - I have not made sufficient contributions to this paper
- Belle allows for **up to 3 primary authors** who will be **listed first**, in the order chosen by the analysis group. While 90% of the first 30 publications had an alphabetically ordered author list, **only 10%** of the most recent 30 papers had authors **listed in alphabetical order**.
- **All this is done without intervention by the Belle Management !**
- **This innovative practice enjoys the strong approval of Belle members!**

Belle Practice: Number of Authors vs Time





2nd Alternative – Partition into AWGs

- Partition into 10-15 AWGs
 - probably along the lines defined by analysis working groups (AWG), with all scientists participating in one, in some cases two, and in exceptional cases more working groups.
- AWGs specialize in different areas of physics
 - develop common analysis tools, meet regularly, and report progress and problems.
- AWG leaders interact frequently Collaboration Leadership
 - with the physics coordinator, the computing and software teams as well as the detector operation teams.
- The federated publication oversight by the collaboration remains
 - through its publication board and analysis coordinators, Review Committees
- A sign-up for authorship like Belle
 - would allow individuals to decide case-by-case whether their contribution truly justifies authorship.
- Lead authors would be chosen and listed first.
- This scheme could reduce the author list by a factor of 10 or more.



Impact of Alternatives to Current Practice

- **Belle Practice: Sign-up for Authorship and – Lead Authors**
 - Authors are more knowledgeable, take responsibility for publication
 - Reduced authorlist was achieved with-out reglementation from management
 - Emphasizing lead authors is considered attractive, has led to special recognition of young scientists!
 - Primary authors allow readers to identify contacts
 - Emphasis on analysis over contribution and innovation in software and hardware has not been a major issue !
- **Partition of Collaborations into Physics Analysis Groups**
 - Partition along physics topics already exists!
 - The active participation of more than a 50 - 100 scientists in the preparation of a publication is probably not practical anyway
 - A selective authorship may apportion credit in a more balanced, but less uniform way!
 - A longer list of primary authors could include also those who made technical contributions or consulted on physics
 - **CONCERNS:** Would coupling of AWG to authorship lead to friction and competition, to neglect of common tasks? to fission?



WG on Authorship : Practices in Other Fields

- **ALICE at LHC:** 1000 scientists at 86 institutions.
 - They plan to adopt the same practice as HEP
- **The LIGO Scientific Collaboration (LSC):** 400 members at 41 universities.
 - author list of scientific publications with all members of the LIGO Scientific Collaboration with rights to the data, plus engineers who contributed to the design, construction, or operation.
 - LIGO has published few physics papers, plus a large number of technical papers signed by those involved in the particular work.
- **The Sloan Digital Sky Survey (SDSS):** 200 scientists at 14 universities.
 - They distinguish four types of publications with different author lists:
 1. scientific publications signed by those directly involved in the data analysis as well as any members of the technical team who built the telescope;
 2. data release papers, signed by the team of scientists who analyzed the data;
 3. technical papers signed by those directly involved in the technical work;
 4. follow-up papers on public data by a few authors with reference to SDSS. For the 100 scientific publications in print, the typical number of authors varies between 30 and 50
- **The Human Genome Sequencing Consortium :** 2000 authors at >100 institutions
 - a variety of practices and members have reported that the responses have not always been positive.
 - For some of the major publications, only 200 authors, mostly the team leaders



Sampling of HEP Opinions

- Following discussion of various practices and the working group prepared a **questionnaire to sample the community's response to a few options for authorship.**
- The questionnaire was distributed to the large collaborations via the www, and members of the WG on authorship acted as contacts .
- In total, **880 scientists responded**, and the responses were tabulated by Daniel Whiteson of CDF.
- The response was voluntary and not uniform, **~50% of the responses were from senior scientists.**



Questionnaire on Authorship

Current Practice

- Q1: Do you consider the **alphabetic listing of all members** of the collaboration the **appropriate way to credit** those who contributed to the published research?
- Q2: Do you support the introductions of a new class of publications, **Scientific Notes**, that document analysis methodology, detector and physics simulations, novel algorithms and software developments as **a way of acknowledging individual contributions** to the experiment and the physics results?
- Q3: Would you support the proposal to have **only the names of two contact persons** printed above the name of the collaboration, and have the names of the remaining authors recorded in alphabetical order, accessible electronically?



Questionnaire on Authorship

Belle Practice

- Q4: Would you consider a **sign-up as practiced by Belle** as a good way to identify and **appropriately credit** those who contributed most to the published research.
- Q5: Would a **reduction in the number of publications** in which you are listed as author critically **impact the support** you and your colleagues receive from your home institution and funding agency?
- Q6: Would you agree that the practice of listing in **non-alphabetic order the names of up to ten scientists** who contributed most to the published research is an effective way to **identify the corresponding authors and give credit to those most deserving?**



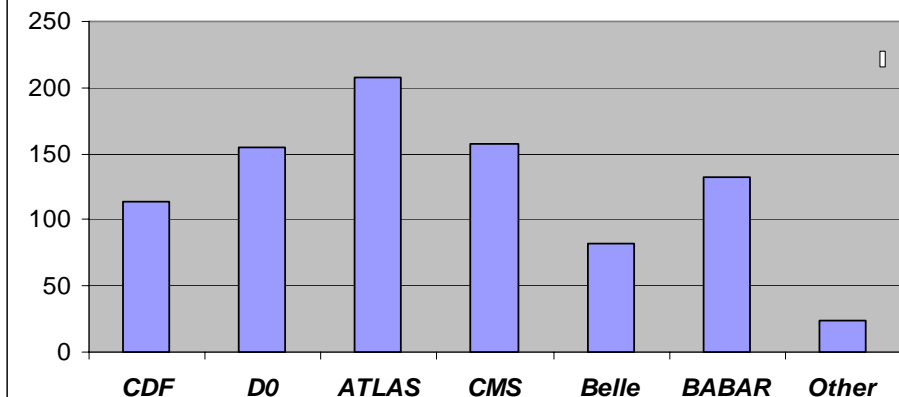
Questionnaire on Authorship

Subdivision into Analysis Analysis Consortia

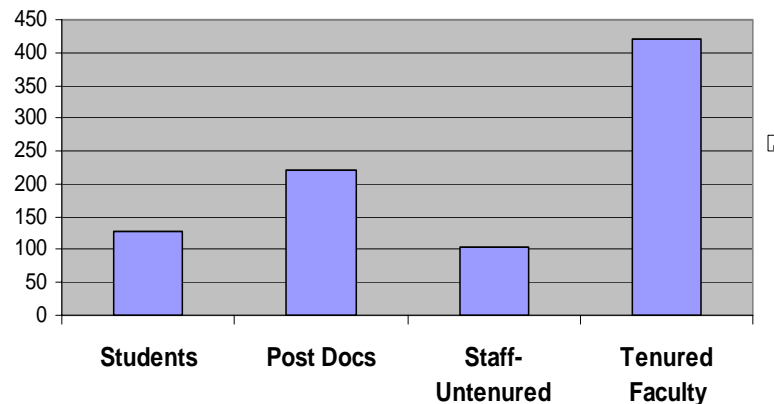
- Q7: Would you agree that a **partition of the large collaborations into smaller physics research groups** focusing on selected topics is an effective way **to organize research activities** while maintaining the support for detector operations and common software ?
- Q8: Would you agree that the **partition into smaller physics** research groups would also be an **effective way to establish authorship**, i.e. **restricting authorship** to members who have contributed directly and are most knowledgeable about the research results presented?

880 Respondents to Questionnaire

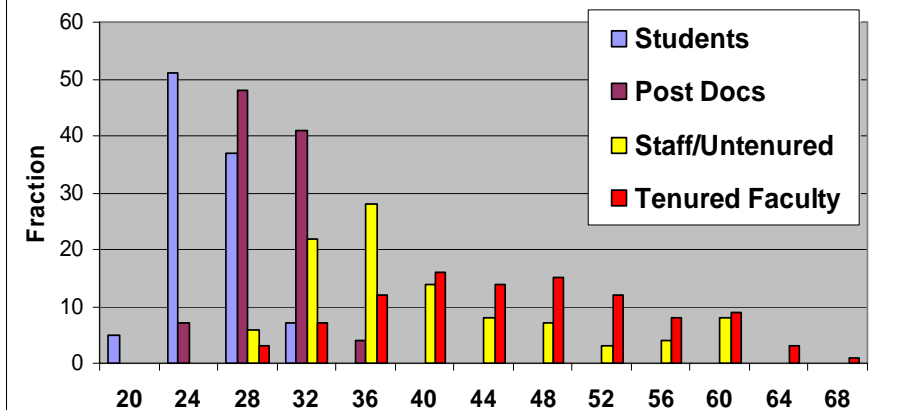
Collaborations



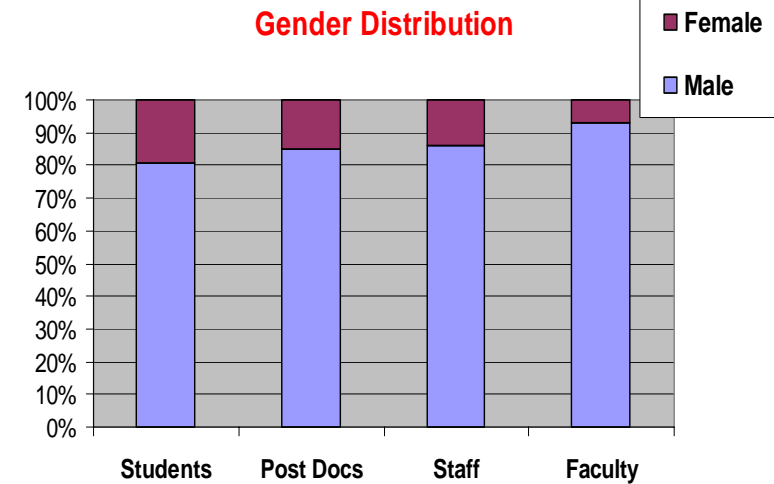
Career Status



Age Distribution



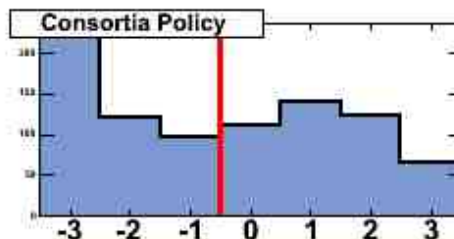
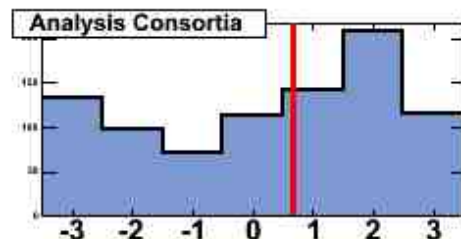
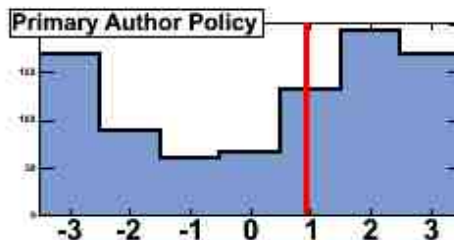
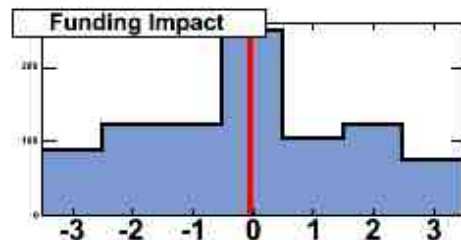
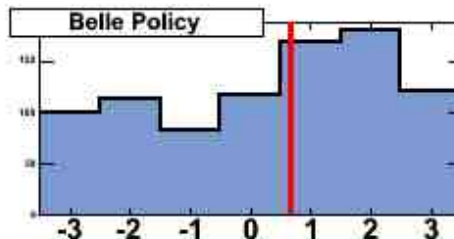
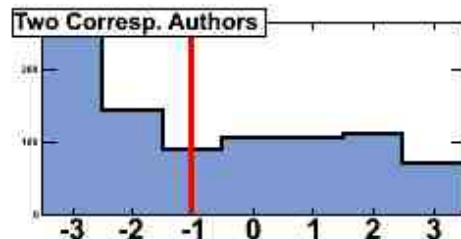
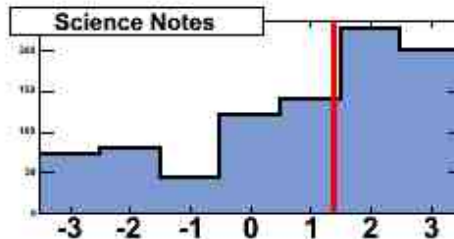
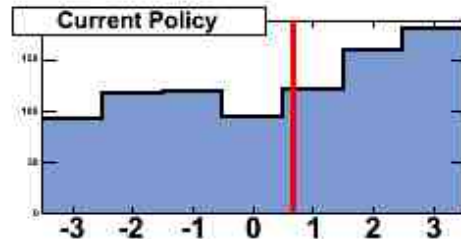
Gender Distribution



Responses to Questionnaire:

-3 = NO

+3 = YES



Current Practice

- Q1: Full Alphabetic Listing
- Q2: Separate Scientific Notes
- Q3: 2 Corresponding Authors

Belle Practice:

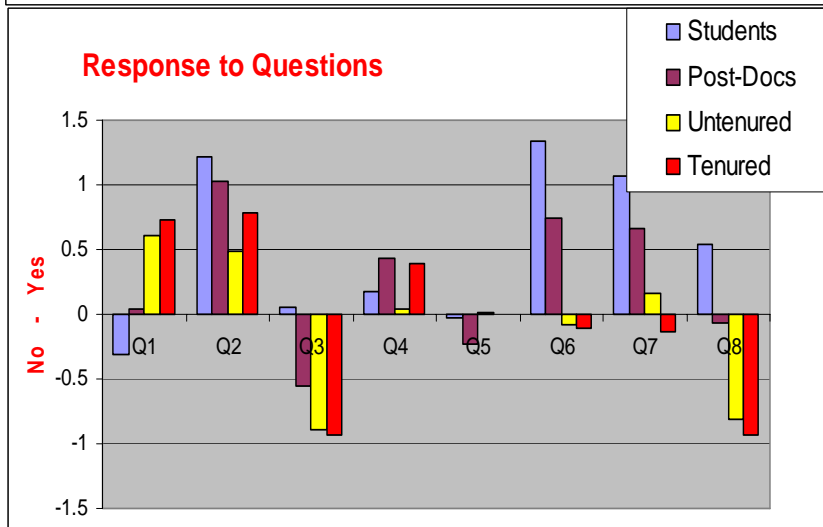
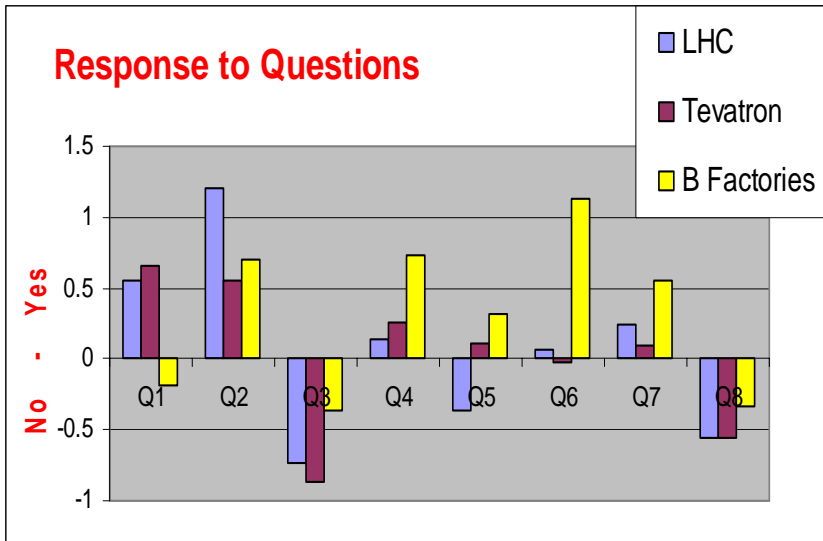
- Q4: Sign-up for papers
- Q5: Funding Impact?
- Q6: Primary Authors

Partition into Analysis Consortia

- Q7: Effective Organization
- Q8: Restricted Authorship

Responses to Questionnaire

Medians of Distributions:



Current Practice

Q1: Full Alphabetic Listing

Q2: Separate Scientific Notes

Q3: 2 Corresponding Authors

Belle Practice:

Q4: Sign-up for papers

Q5: Funding Impact?

Q6: Primary Authors

Partition into Analysis Groups

Q7: Effective Organization

Q8: Restricted Authorship



Conclusions

- **HEP authorship is different** from what most scientists – especially those outside the field – expect it to be.
- All existing collaborations have rules in place that regulate membership and authorship. **Members are usually authors, as long as they contribute to the experiment.**
- The Belle Collaboration introduced voluntary sign-up and primary authors, and their practice is highly favored by its members.
- The C11 questionnaire provided some insight in how current practices are viewed – **younger scientists appear to favor more recognition for those actively involved in physics analysis.**
- Many senior members consider a change of rules unnecessary, and possibly damaging to the spirit of the collaboration.
- **Obviously, C11 or IUPAP cannot and will not establish rules and expect the community to accept them!**
- **Nevertheless, C11 hopes that these discussions have raised conscientiousness of this important issue.**
- **Please take time to think about this – it is important to you and our field!**