WG1:
Detector Physics, Simulation, Algorithm and SW Tools Working group

WG1 topics

By looking at previous discussion the following areas have been idenfified

- Areas to contribute to
  - Detector Physics:
    - calorimeter performance studies
    - data/MC comparison
  - Simulation
    - Full sim
    - Fast sim
  - Algorithm
    - Particle flow algorithms
    - Machine learning approach
  - SW Tools:
    - Data models and data management
  - DAQ software

- Contact with SW Package
  - G4, EUDAQ, DD4HEP, KEY4HEP

ECFA Survey circulation

- Get a picture of the SW used by people
- Start knowing people involved in the SW development
  - no binding, but let’s start knowing each other!
- Opened 1 week ago
  - 48 responses so far
  - it will stay open, please fill it out if you haven’t done so

DRD6 Working Group on software

We would like to collect information on which topic people working in the DRD6 is contributing or has interest to contribute.

gabri.gaudio@gmail.com Switch accounts

Not shared

* Indicates required question

Name and surname *

Your answer

email *

Your answer

Institute *

Your answer

DRD6 WP *

Choose

Subtask (if applicable) *

Your answer

Area of interest in the Software

Detector Physics

- Calorimeter performance studies
- Data/MC comparison
- Other:

Describe your activity (present or foreseen)

Your answer

DAQ Software: describe your competence

Your answer

Are you part or do you have close connection with one of the following SW Package community?

- Geant4
- EUDAQ
- DD4HEP
- Key4HEP
- Mode
- Other:

Anything else you want to highlight for the needs of the WG on SW of DRD6?

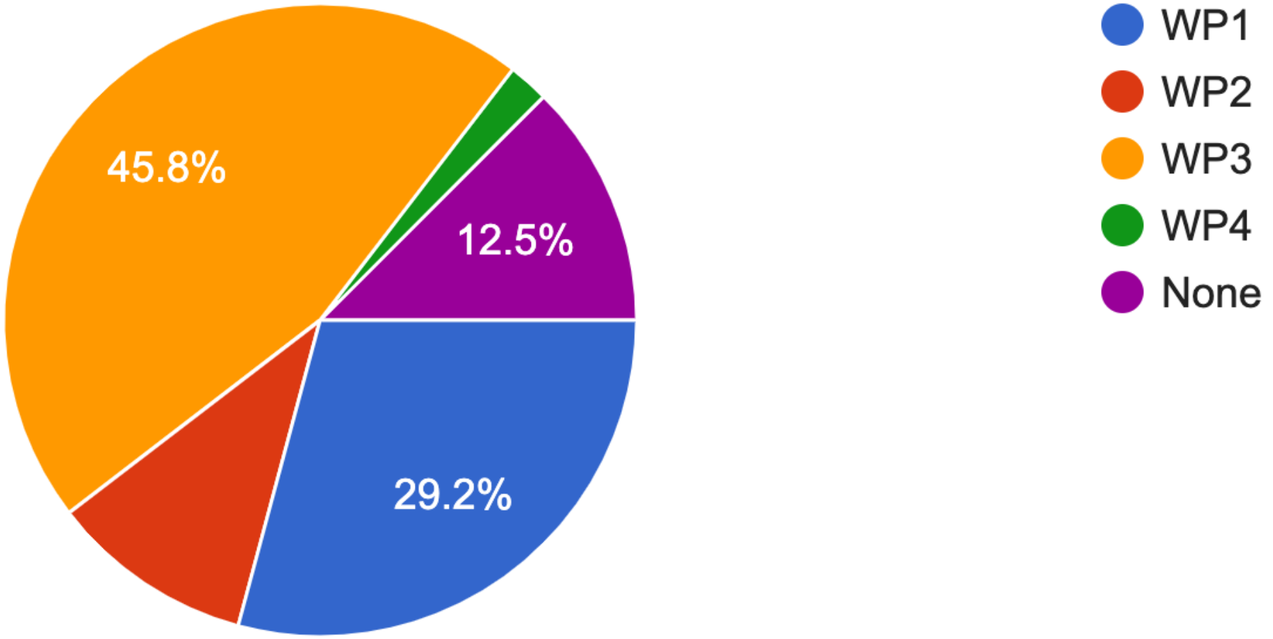
Your answer

Similar for the other Areas as described before

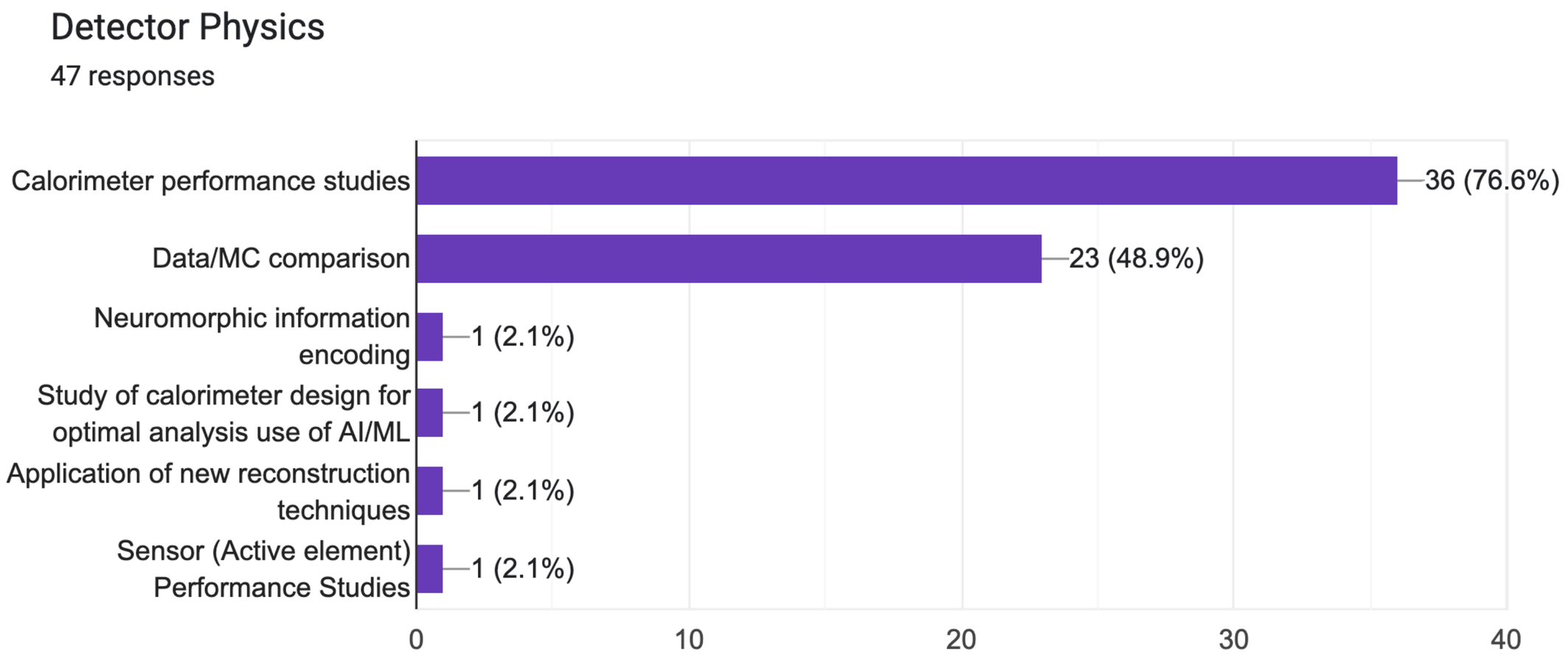
Some statistic

DRD6 WP: are you already working in an activity connected to a Working Package?

48 responses



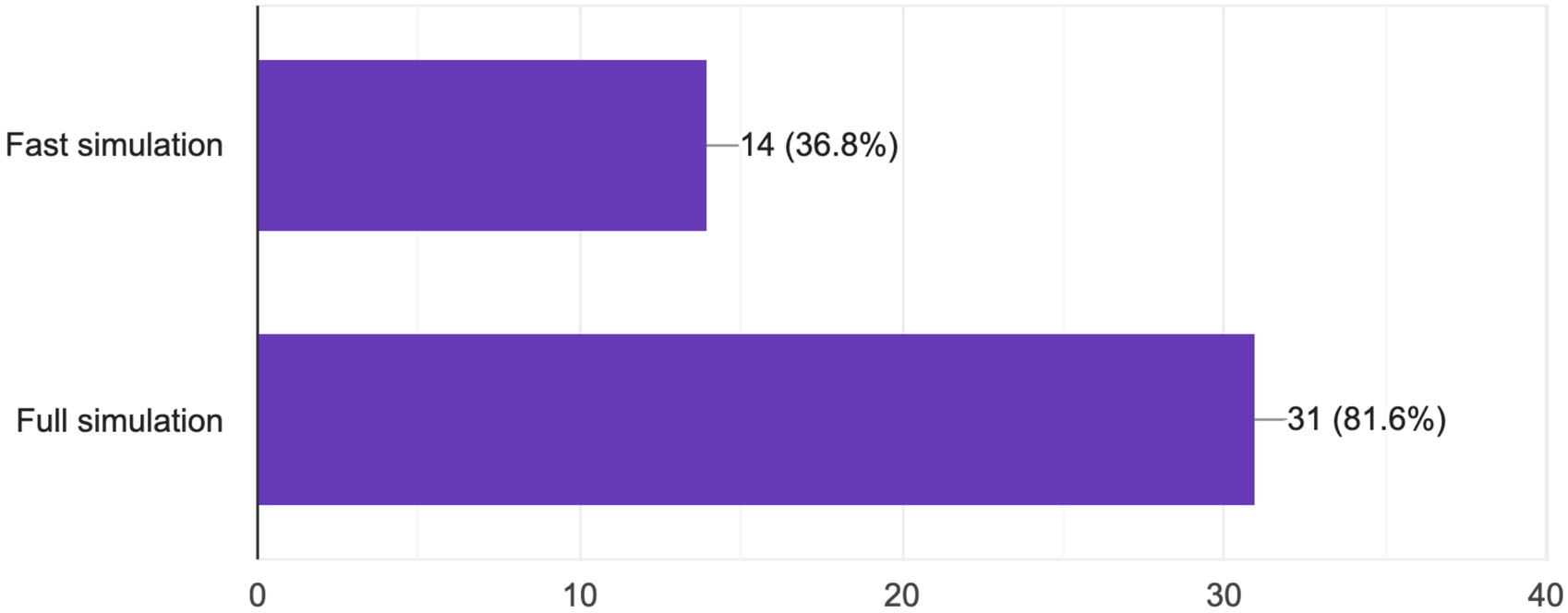
Interest in detector physics



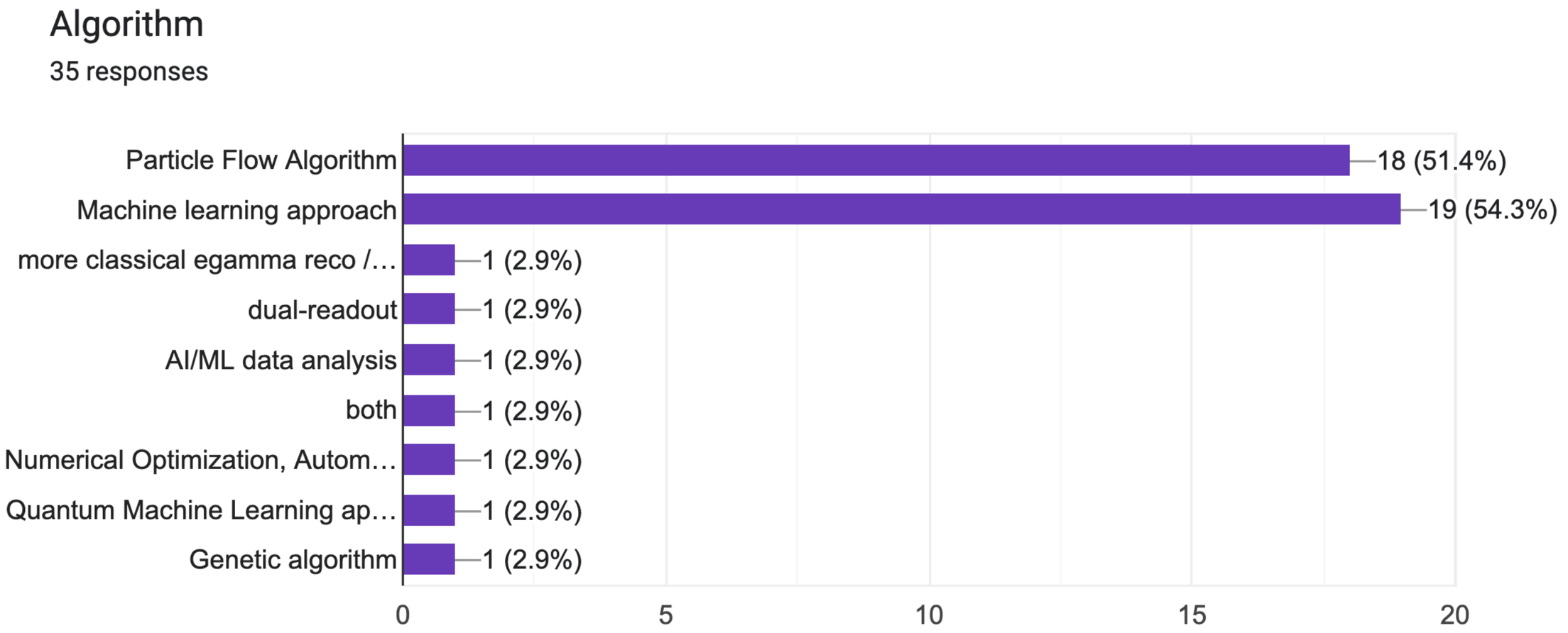
Interest in simulation

Simulation

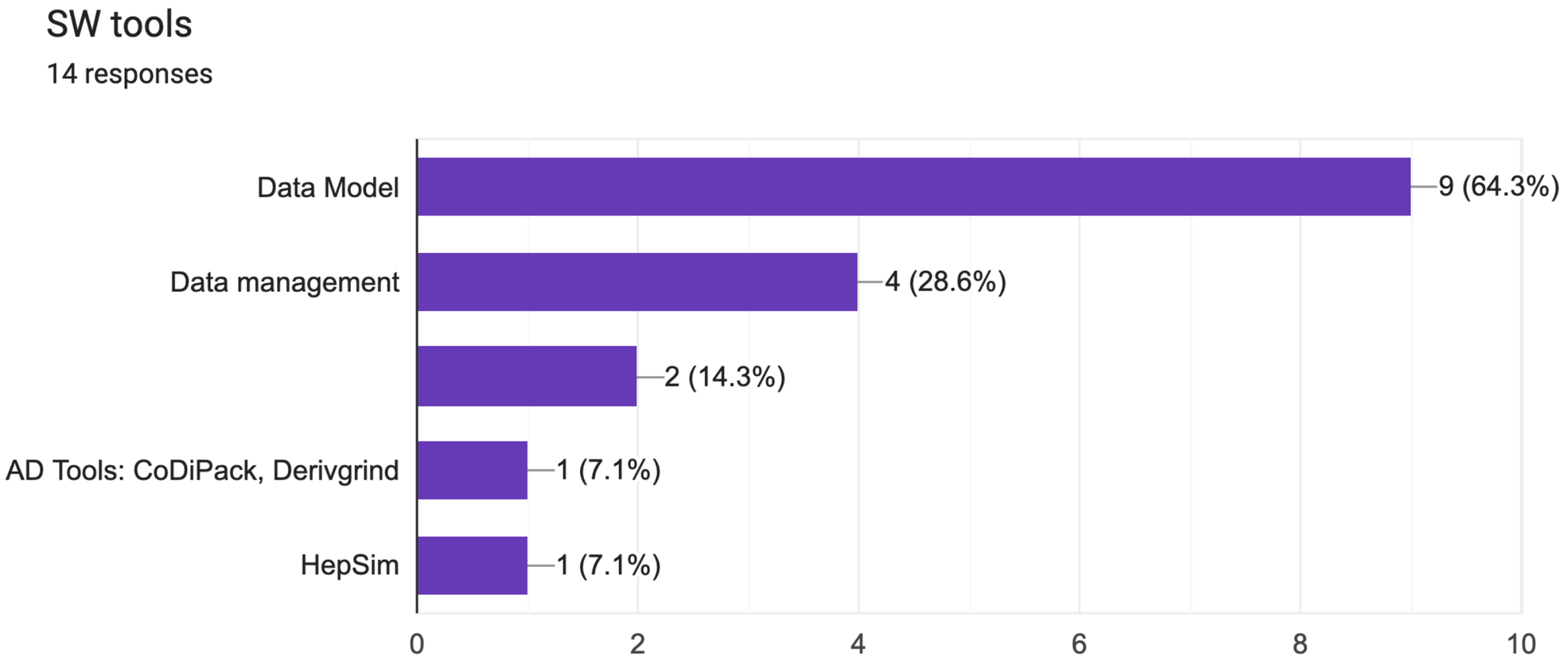
38 responses



ECFA Interest in algorithms



ECFA Software tools

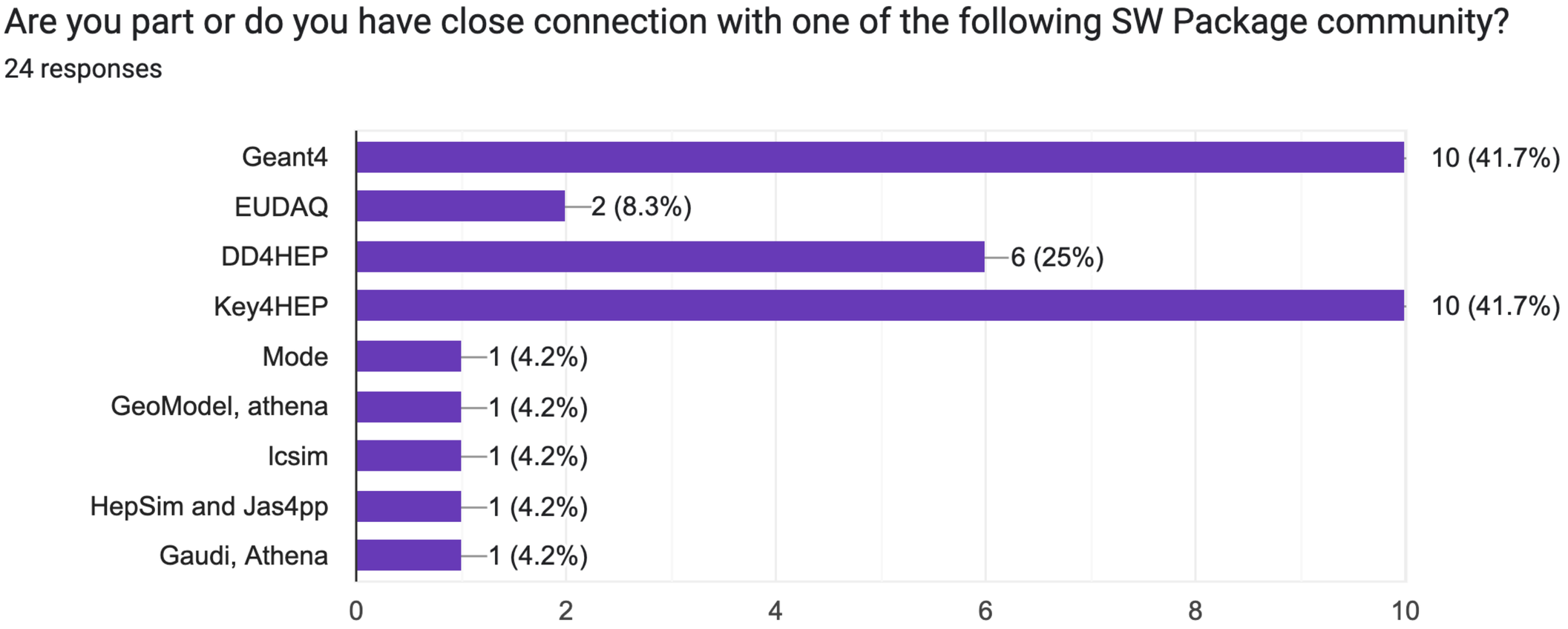


ECFA DAQ software

European Strategy Update

- 11 (positive) responses received
- Some reported large experience in DAQ software and DAQ systems
  - Shared topic among WG1 and WP4
- Also mentioned:
  - EUDAQ
  - Front-end electronics modelling in calorimetry simulation

ECFA Software Tools



Some general comment collected

Some general comment received
(all are in the same line)

Harmonize the demands from each WG to the software, create better connection to the common framework e.g. Key4HEP, DD4HEP, etc.

Get as many people as possible to use the same software, so the collaboration between different teams will be stronger, progress faster and everyone will profit from it

a common repository where all the software used by the various group can be shared; this would help newcomers to not start from scratch. It could be good to have on a DRD6 software webpage a list of people to contact in case of problems on a specific software.

DRD6 presents a unique opportunity to streamline the software tools available to the test-beam communities. This would ensure long-term preservation of the code and enhance accessibility for the entire calorimetry community.

Complete overview of the Software ecosystem by Brieuc Francois at April Collaboration Meeting

https://indico.cern.ch/event/1368231/contributions/5885955/attachments/2831323/4954790/20240411_SW_ecosystem_Brieuc_Francois_DRD6.pdf

Good starting point for the WG building up

Summary

- DRD6 has important software needs
- Using a common software ecosystem will allow us to leverage synergies
  - Across DRD's, across DRD6 WP's and across WP phases
- Data persistency must be a central consideration (valuable datasets will be produced)
- Key4hep is a very good candidate to be the common software base for (most) DRD6 activities
  - Wide (and growing) adoption by the Future Collider Community (but built with LHC experience)
  - Already meets most DRD6 needs (except for online software, likely not integrated in Key4hep, but for which we should still have common standards)
  - Under active development: can be adapted/complemented if needed
- The Key4hep team warmly welcomes new contributors
  - Good opportunity for the DRD6 Transversal Software Working Group!
- Next important step: agree on the set of software tools that we want to set as standards

Thanks to the Key4hep team for the useful feedback and discussions!

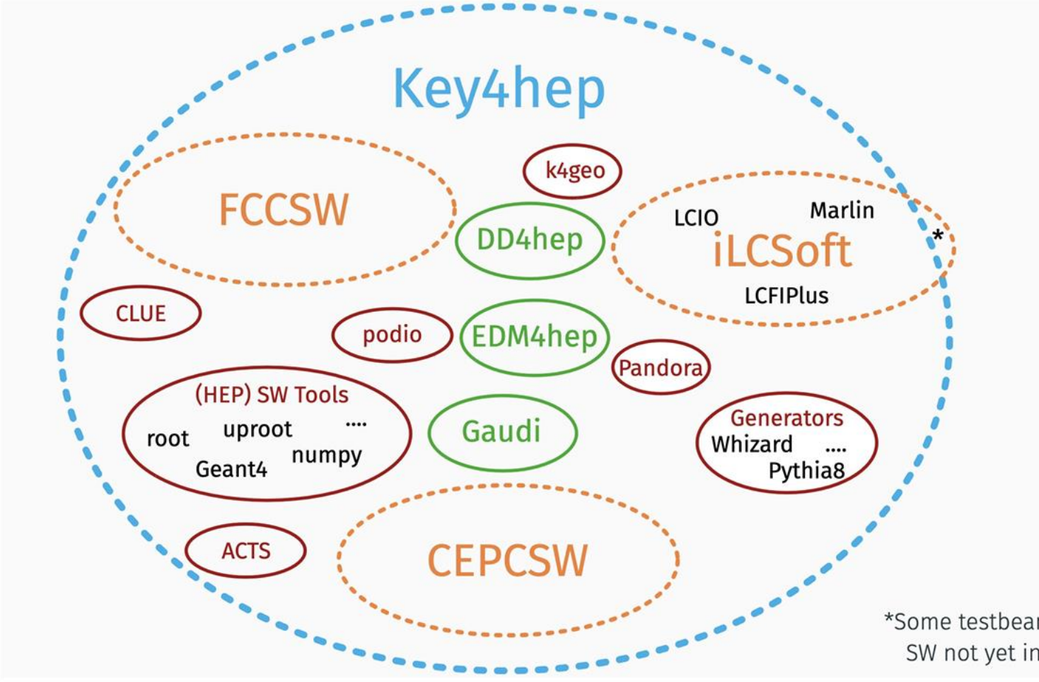
SW ecosystem for DRD6 Brieuc François 24

ECFA Proposal to have Key4Hep as a baseline Framework

European Strategy Update

- A good candidate for DRD6 **software ecosystem** should be "**modern**", used by a **large community** and with good chances to be **maintained over the long run**
  - Key4hep would be a natural choice to develop (most) DRD6 software
  - Win-win situation
    - Key4hep already meets a lot of DRD6 needs (profit from existing component)
    - Seamlessly port DRD6 developments (e.g. from test beams) to the more general future collider Full Sim studies (already using Key4hep)

- Key4hep is a **software framework** serving (and developed by) the **future collider community**
- **Key4hep** guiding principles
  - **Interoperability:** what is developed by some should be useable by others (with minimal modifications)
  - **Versatility:** covers a large spectrum of needs (serves diverse facilities and detectors)
  - **Flexibility:** still under active development (nothing is frozen), targets "the future" → has to adapt to evolving needs, detector configurations, etc



From Briec's presentation