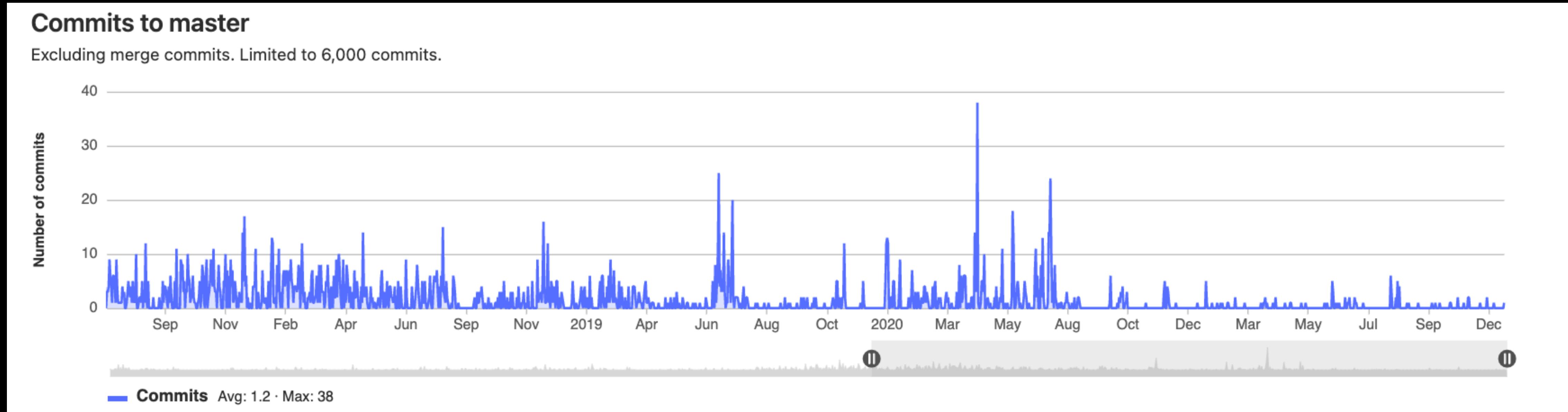


# Virtual OPAL Developer Meeting 2022 - Introduction



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# Content

1. Updates OPAL (A Adelmann)
2. Updates on IPPL V 2.x (S Muralikrishnan)
3. New challenges in FEL modelling and consequences for OPAL (A Adelmann)
4. pyOPAL (Ch Rogers)
5. 2022 releases (A Gsell)
6. Pressing open issues (all)

# Updates

- \* 88 94 member in the active mailing list ([opal@lists.psi.ch](mailto:opal@lists.psi.ch))
- \* +1 very active developer



Dr. Muralikrishnan Sriramkrishnan

# Latest OPAL release is: 2021.1.0

- New Undulator element with its own FDTD electromagnetic solver,
- LOWENERGYTHR attribute for energy loss calculation by  
PARTICLEMATTERINTERACTION command
- Energy loss calculation and beam scattering are available for all light ions
- Stopping power at low energy region
- ALPHA particles are supported in BEAM command
- ENABLEVTK option (default true) to control writing of voxel mesh output
- OUTFN attribute has been added to Cyclotron and Source elements
- Gas stripping is now available for DEUTERON beams and H2P beams in AIR

# At present the focus in large is on:

- continue consolidation & code cleanup
- working on bugfixes / feature requests
  - 15 bugs 19 feature requests

\* delayed OPAL paper



# Current projects - 1

- P3M in OPAL (IPPL 1.0) (Sri & AA)

- IPPL 2.x (Sri & Matthias)

✓ FFT based poison solver

✓ ORB

- Ch Rogers

- FFA modeling (Ring element)

- pyOPAL

- Sri & AA + MSc student

- SwissFEL modeling

# Current projects - 2

- Prepare OPAL for IPPL 2.x (AA)
  - ✓ adapt cmake such that IPPL is an external library
  - ✓ header file adaption
- Tensor and/in Quaternion class

The screenshot shows the Boost QVM documentation page. At the top, there's a green banner with the Boost logo and a note about old documentation. Below the banner, the title "QVM: Quaternions, Vectors, Matrices" is prominently displayed. Underneath the title, there's a section titled "Quaternions, Vectors, Matrices". A snippet of code is shown, illustrating how to create a quaternion object that rotates around the X axis.

This is the documentation for an old version of boost. Click here for the latest Boost documentation.

“...one of the most highly regarded and expertly designed  
— Herb Sutter and Andrei Alexandrescu

## QVM: Quaternions, Vectors, Matrices

### Quaternions, Vectors, Matrices

Out of the box Boost QVM defines generic yet simple `quat`, `vec` and `mat` types. For example, the following snippet creates a quaternion object that rotates around the X axis: