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# **Homepage of the Accelerator & Beam Physics Modeling interest group (Snowmass 2021)**

*Release 0.12.0-dev*

**Snowmass 2021 COMPF2 Accelerator & Beam Physics Modelin**

**Jul 10, 2020**



# CONTENTS

- 1 Code of Conduct 3**
- 2 Introduction 5**
  - 2.1 Topics . . . . . 5
- 3 LOI 7**
  - 3.1 Contribute . . . . . 7
    - 3.1.1 Templates . . . . . 7
  - 3.2 Proposed . . . . . 7
  - 3.3 Submitted . . . . . 7
- 4 Community 9**
  - 4.1 Contact . . . . . 9
    - 4.1.1 Mailing Lists . . . . . 9
    - 4.1.2 Slack Channels . . . . . 9
  - 4.2 Meetings . . . . . 9
    - 4.2.1 Calendars . . . . . 9



This is the homepage of the *Accelerator & beam physics modeling* interest group in the topical group *Theoretical Calculations and Simulation* (CompF2) of the APS DPF *Snowmass21* process.

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TODO: Download this whole homepage also as a PDF document [here](#).



## CODE OF CONDUCT

Please see the [Snowmass 2021 code of conduct](#). As an APS-sponsored process, we will abide by the [APS code of conduct](#) for all meetings.

This interest group is also part of the process, so in our conversations here we pledge to conduct ourselves in a professional manner that is welcoming to all participants and free from any form of discrimination, harassment, or retaliation. Participants will treat each other with respect and consideration.

In addition, APS DPF has drafted a set of Core Principles and Community Guidelines to which members pledge to adhere. Please see the [Snowmass page](#) for more information.





## INTRODUCTION

### 2.1 Topics

As interest group of the *Theoretical Calculations and Simulation* (CompF2) topical group in the *Computational Frontier* our topics of interest include:

- Modeling of
  - Colliders (leptons, hadrons, gamma, mix) \* rings \* Linacs \* Entire machine complex
  - Advanced Concepts \* plasma accelerators (LWFA, PWFA) \* dielectric
  - Specific physics topics \* beam-beam \* Halo \* Collisions \* Radiation \* Spin dynamics \* Space charge \* Coherent synchrotron radiation \* Wake fields \* Quantum limit in novel accelerator structures \* X-ray simulation \* ...
  - Components \* RF cavities \* Magnets \* ...
  - ...
- Crosscutting topics \* Commonalities in comp. needs \* EVA (End-to-end Virtual Accelerator) \* HPC / Exascale / programming
  - GPUs; future hardware
  - higher order methods/numerical linear algebra to make efficient use of GPUs
  - computing hardware independent implementation e.g. Kokkos/RAJA/Alpaka/AMReX
  - Mixed precision: half (various), single and double
  - Tensor cores
  - Standardization of output data, input scripts (openPMD, ...)
  - Data management & data reduction
  - Online modeling
  - AI/ML
  - Open Science
  - Resources, training
  - Software sustainability
  - Integration of accelerator and detector (for radiation studies) codes



## 3.1 Contribute

Letters of Intent (LOI) can be contributed in the following ways:

- pull request example (rst)
- pull request example (pdf)
- per e-mail (tzzzz)

### 3.1.1 Templates

We suggest to use the following template for LOIs. . .

## 3.2 Proposed

Proposed topics for LOIs derive from our topics (ref me)

## 3.3 Submitted

- real letter 1
- real letter 2
- example rst
- example PDF



## COMMUNITY

### 4.1 Contact

#### 4.1.1 Mailing Lists

Our interest group and community organizes in the following ways:

- Snowmass e-mail list
- computational frontier e-mail list
- COMPF2 e-mail list
- interest group mailing list?

#### 4.1.2 Slack Channels

Our interest group and community organizes in the following ways:

- Snowmass e-mail list
- computational frontier e-mail list
- COMPF2 e-mail list
- interest group mailing list?

### 4.2 Meetings

#### 4.2.1 Calendars

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**COMPF2**

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