# PUNCH2.0 Use Cases: key4HEP based workflows for future colliders (FCC, ILC, CPEC, ...) Philip Bechtle, Harry Enke, Frank Gaede

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# Motivation

- Particle Physics is currently in a phase where worldwide new lartge-scale projects are being envisaged or already being decided upon
- These will shape the field for the next 50 years
- Up to now: no formal collaborations, physics studies just picking up
- One common framework for simulation, reconstruction and analysis already in place: The key4HEP environment
- Large demand in the community for easy starting points for students
- Ideal starting point for PUNCH2.0 to entering and co-shaping a field





# Discussion

## Full Document

https://docs.google.com/document/d/1jES5IXYEd1JzI27TQQcnA\_ Z3ZeZUCZRvnEHo-2nx50c/edit?usp=sharing

#### **General Description:**

The goal would be to establish the PUNCH technology as the core of making physics studies for future colliders possible in the wider community. Providing DRPs for each necessary step, and DRPs for core physics studies, would allow any incoming student to have an enormous head start over the "traditional" way. The goal would be to establish these technologies in the future collider community and thus widen the user base of PUNCH to a worldwide community and make PUNCH persistent by contributing to efforts going on for many decades.



# Discussion

### Elements/Pillars:

All: Living Infrastricture / Living Data / Living Science Each Master/PhD thesis which contributes to a TDR could be a living/interacting document on the SDP

## Problems Solved:

PUNCH: Making PUNCH future proof / widening the PUNCH user base Users: Persistent Reuseable Analyses

### Gaps to be filled:

The enormous gap between Frank's knowledge and capabilituies and the average Master student

#### What is generic:

Since the whole of PUNCH2.0 is needed, gaps in PUNCH capabilities are automatically identified and worked on



# Discussion

## End-to-End FAIR:

Yes! No formal collaborations yet

# Connections to DRP:

Everything

# View from outside PUNCH:

It could put PUNCH on the worldwide map

## Workflow:

Everything from Event Generation Over Simulation to Reconstriuction to Analysis to publication

## Organizational Model in PUNCH:

Have Postdocs and PhD students working 1/2 in Pillars and 1/2 in FCC/ILC/... physics studies

# Sustainability:

Try to get into something that will go on for 50+ years, at least if we make it without succumbing to autocratic morons in the meantime

PUNCH Use Cases: key4HEP

# **Steps**

#### **Steps:**

Fully integrate S4P, C4P and the DRP Use it for physics studies Improve

