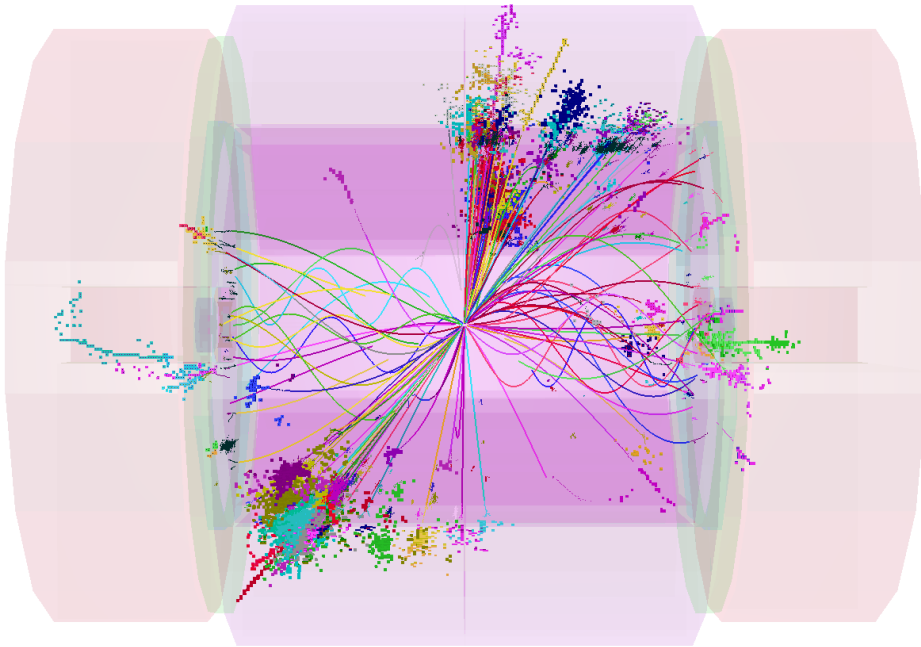


LC Software and CLIC

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This Talk:

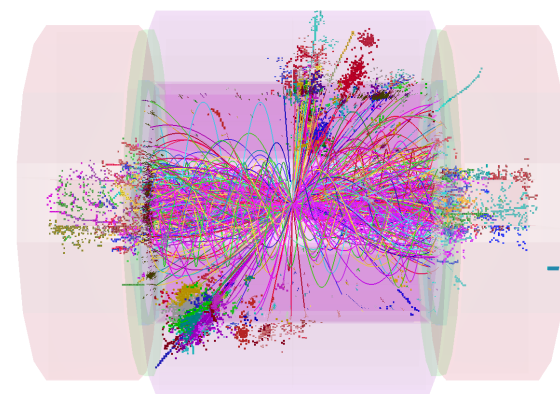
- What was done for the CDR
- Strengths/Weaknesses
- The Future

Introduction



- ★ CLIC provides the potential for e^+e^- collisions up to $\sqrt{s} = 3$ TeV
 - But machine environment is **much more challenging** than ILC
 - Background levels are high
 - 0.5 ns bunch-structure → integrate over multiple bunch crossings of background
 - One of the main **aims** of the CDR was to demonstrate possibility of **precision physics** measurements in this environment

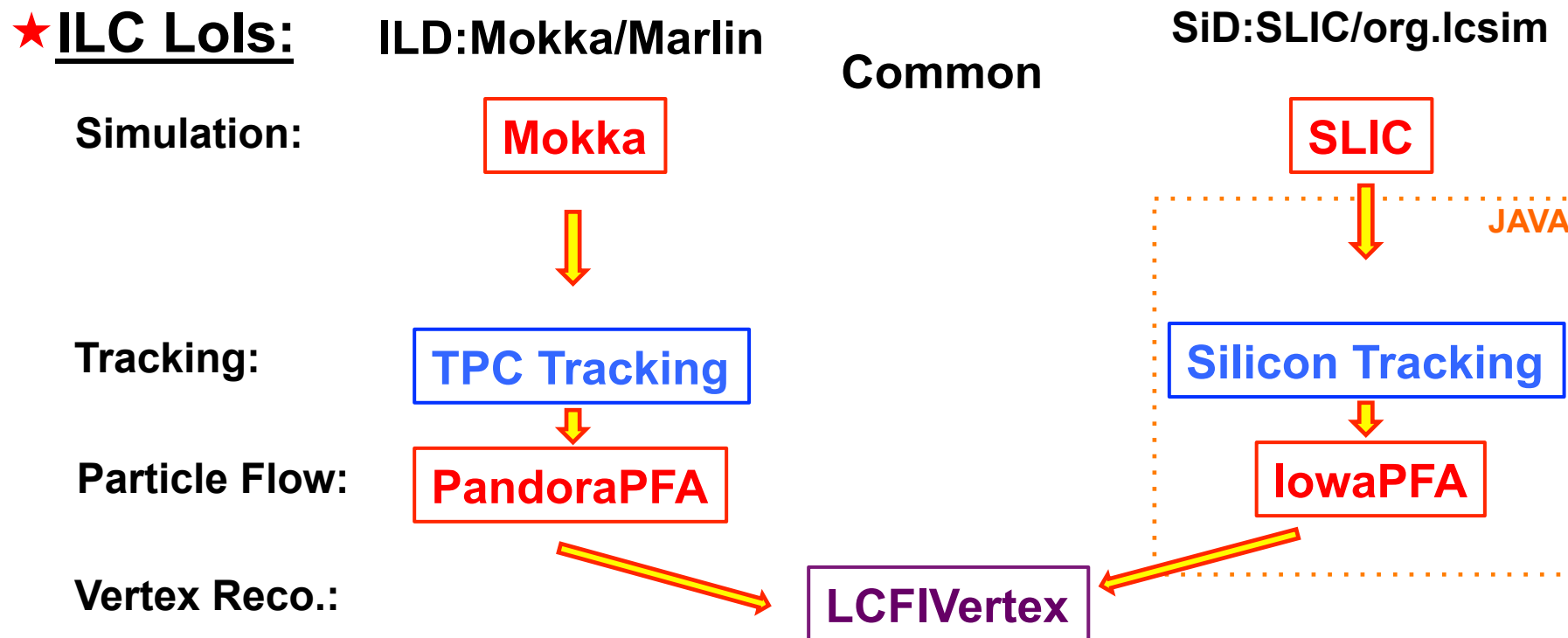
- ★ Performed detailed physics simulations
 - Included pile-up from background
 - Significant software challenge
 - Did not want to choose between ILD and SiD
 - **Used both software frameworks in parallel**
 - Defined detector models in both **Mokka** and **lcsim**



Reconstruction



- ★ All studies used full event reconstruction – highly non-trivial exercise
 - Ideally would have common framework for CLIC_ILD and CLIC_SiD
 - but only had common data format (nevertheless important)



Reconstruction

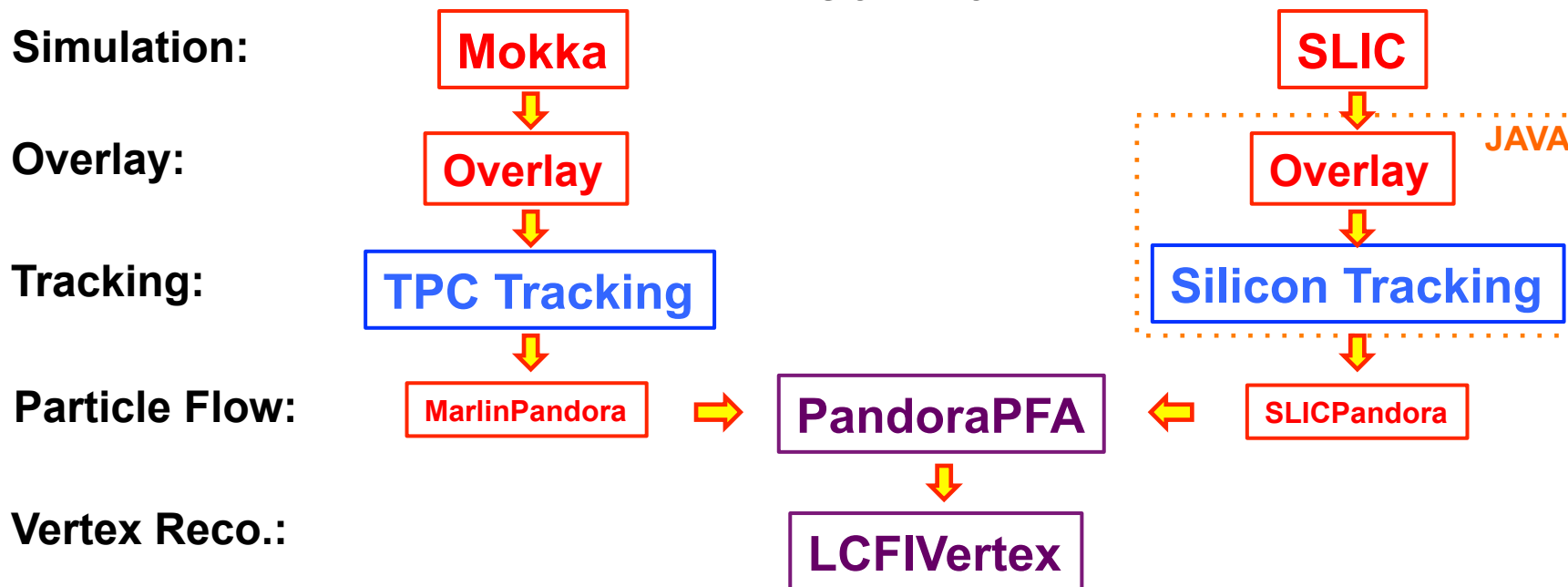


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★ CLIC CDR: ILD:Mokka/Marlin

Common

SiD:SLIC/org.lcsim



- ★ Common data format (LCIO) allowed reuse of PFA and vertexing
 - A great success !

Strengths/Weaknesses



★ Strengths

- Reuse of PFA software worked well
- With some modification, coped with background
- Grid production (with pile-up) difficult, but largely successful
- **We achieved our goals !**

★ Weaknesses

- Support and validation of two frameworks – **very inefficient**
 - **a lot of repeated work**
- Background severely challenged ILD and SiD tracking
- Unable to study impact of pair background on tracking
- Two frameworks makes it hard to share background samples between ILD and SiD

The Future



★ Near term

- Studies of 1.4 TeV about to start for Volume 3 of CDR
- Will again use CLIC_ILD and CLIC_SiD
- Software will remain unchanged from Vol. 2 CDR studies

★ Longer term – post DBD/CDR Vol. 3

- **Strong desire** to move to common framework – otherwise too much unnecessary duplication of work
 - Common simulation framework
Mokka, SLIC or something new (build on strengths)
 - Common reconstruction framework
Probably C++ based – Marlin or something new
 - Proper common (Si/TPC) tracking framework ?
- **Personally – prefer evolutionary approach, but...**

★ CLIC TDR:

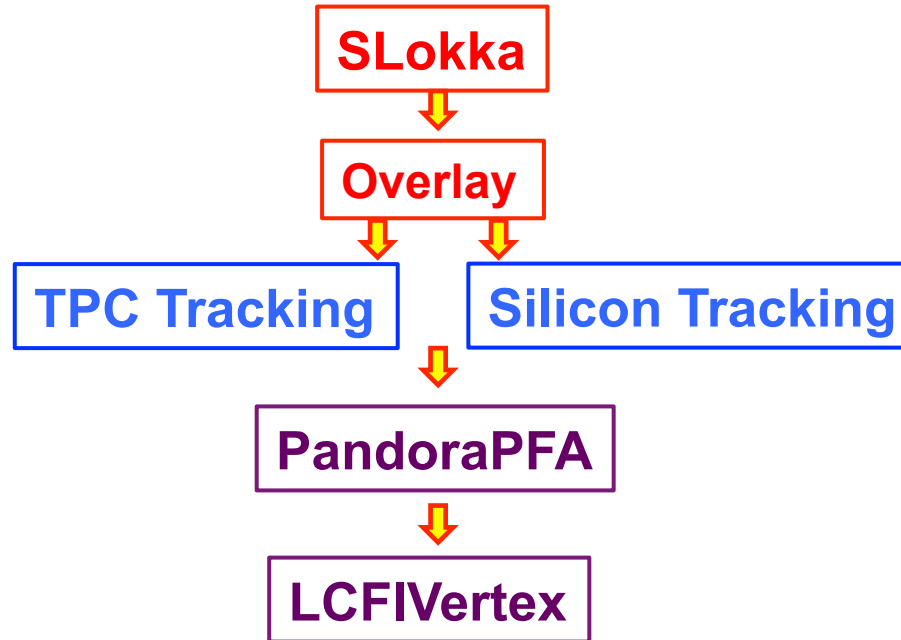
Simulation:

Overlay:

Tracking:

Particle Flow:

Vertex Reco.:



★ This would be a big step forward for CLIC and ILC !