

1.1.7 - Silicon software and simulation

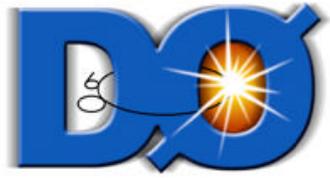
Elizaveta Chabalina

University of Illinois at Chicago

For Run IIb software and simulation group

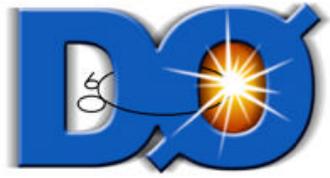
Scope:

- Design and/or modify software tools for Run IIb silicon tracker simulation and commissioning

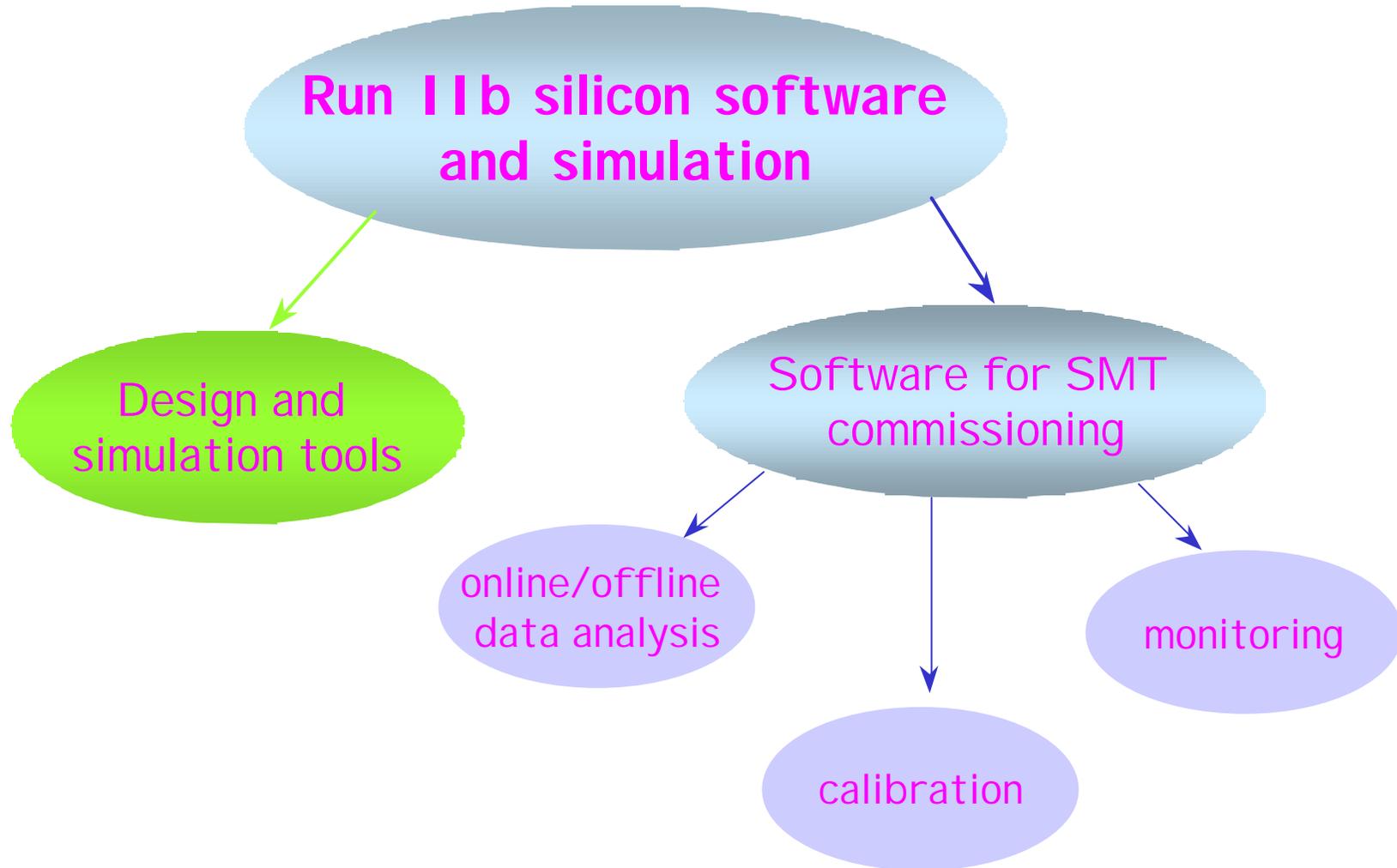


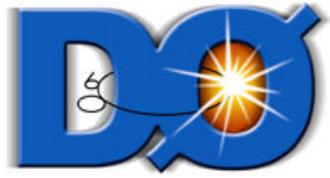
Run I I b software tasks

- Develop and support software tools for design, optimization and performance evaluation of Run I I b silicon tracker
- Develop and support software packages for Run I I b SMT tracker system tests and commissioning



Software project overview





Design and simulation tools

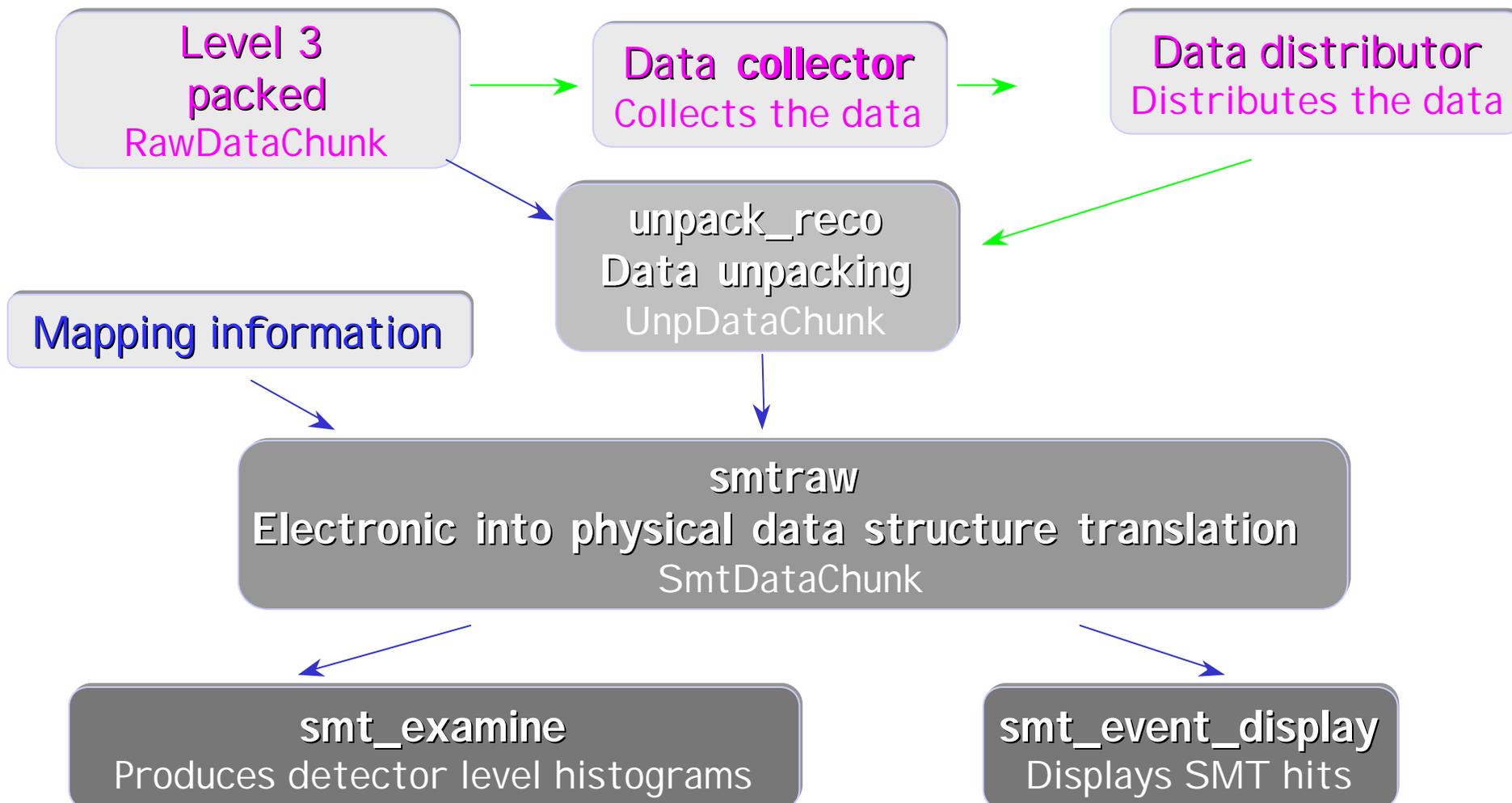
- Implement new SMT geometry in D0gstar (D0 Geant)
- Modify SMT hit storage interface
- Modify SMT hit digitization package
- Modify SMT cluster reconstruction package
- Create standalone package for track reconstruction

« DONE »

Results of the simulation of SMT performance are presented in TDR

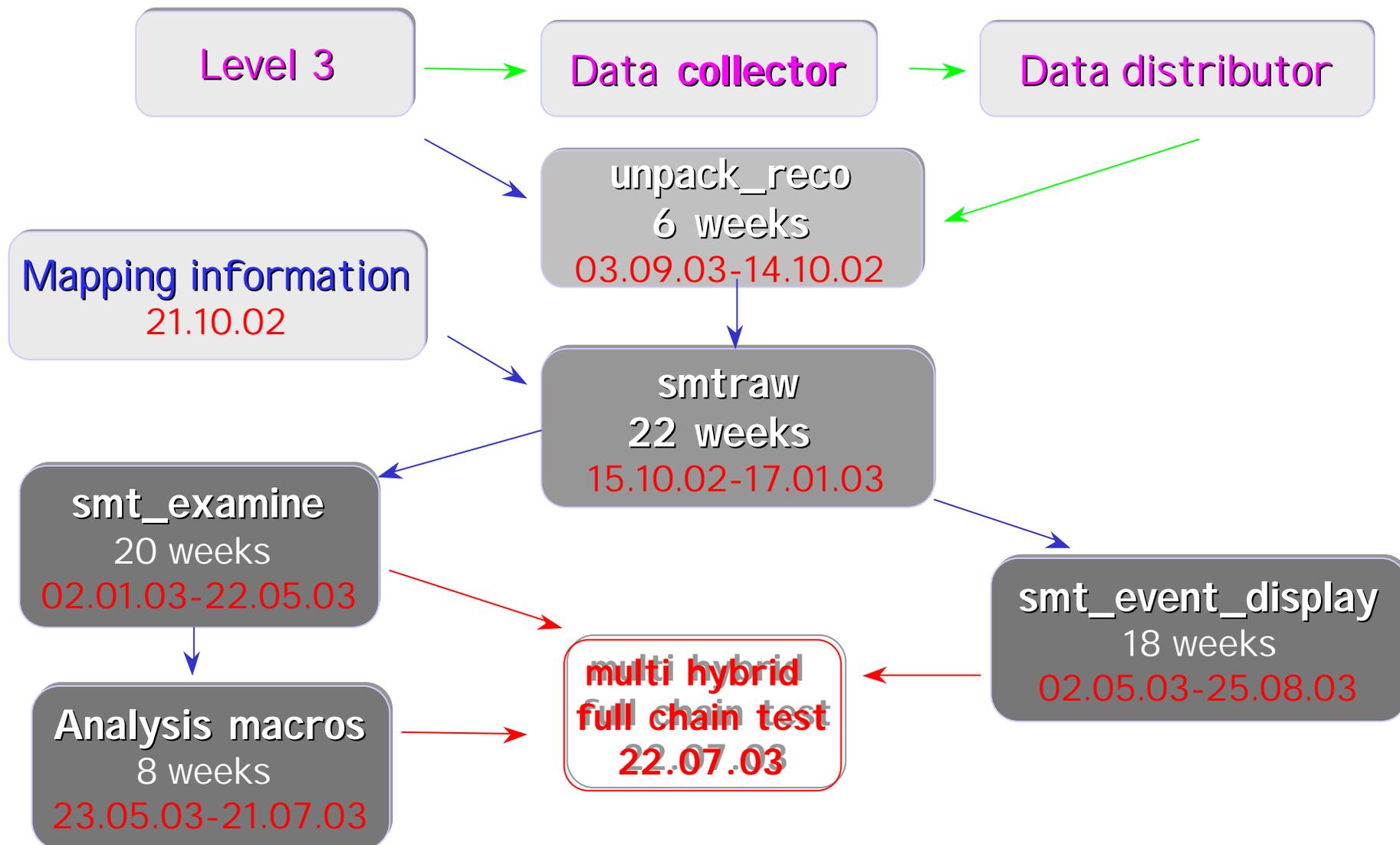


Data flow and associated packages





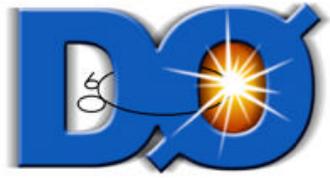
Schedule for data analysis packages





Basis of estimate

| | Run | IIa | Run | IIb | |
|-------------------|-----------------|-----------------|-----------------|-------------------|-------------------------|
| <i>packages</i> | <i>duration</i> | <i>manpower</i> | <i>duration</i> | <i>manpower</i> | <i>Changes required</i> |
| unpack_reco | 21 w | 1 @100% | 6 w | 1 @100% | small |
| smtraw | 21 w | 1 @100% | 22 w | 1 @100% | significant |
| smt_examine | 21 w | 1 @100% | 20 w | 1 @100% 1 @50% | Very significant |
| analysis macros | 8 w | 1 @50% | 8 w | 1 @50% | Very significant |
| smt_event display | 16 w | 1 @50% | 16 w | 1 @50% | Very significant |



Responsibilities within Silicon software group

- Consists of 4 persons right now
- Universities involved : KSU, UI C, Northwestern University
- Develop and support existing Run II b simulation software: F.Rizatdinova, A.Khanov (KSU) and E.Chabalina (UI C)
- Software development for the RunII b commissioning: F.Rizatdinova, L.Chabalina + student (7 months)
- Calibration and monitoring: 2 postdocs and student from Northwestern University



Conclusions

- Simulation tools have been developed and extensively used for both SMT design and performance evaluation
- Standalone reconstruction code has been developed and used for the physics performance evaluation
- All Run II b simulation packages are in the standard DO code repository – available for everyone
- Tasks 1.1.7.1 – 1.1.7.3 have been successfully completed in time
- Estimations for both time scale and manpower based on the Run II a experience is proved to be realistic.