

Planning for Simulation and Physics

- Review plans as per proposal
- Evaluate scope/schedule/effort changes

Task 5.1: Energy Flow Algorithms

1. Identify resolution limiting factors, **simple physics benchmark processes** (linking all detectors, but in limited regions, e.g. t decay, $Z0 \rightarrow$ jets, ...)
2. Algorithm brainstorming: **at least 2 contrasting approaches** to energy flow
3. Define tools required by algorithm (e.g. calo. clustering)
4. **Controlled** comparison, existing codes: single process/detector geometry
5. First implementation of **single** new algorithm
6. Physics benchmark comparison, feedback on tools
7. Further algorithm development and evaluation/refinement

Energy Flow Algorithms

Simulation Work Package	FY'05				FY'06				FY'07			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Understand resolution drivers	=	=	=									
Algorithm brainstorming, competing approaches	=	=	=	=								
Define essential tools		=	=									
Existing algorithms study			=	=								
Implement new algorithm(s)				=	=	=						
Physics benchmark comparisons						=	=					
Further algorithm development/evaluation							=	=	=	=	=	=

Task 5.2: Global Detector Design

1. Use first benchmark physics analysis
first detector concept/parameter set
2. Analysis used for alternative detector concepts
(through LCWS/ECFA-DESY, etc., not nec. by UK)
3. Extend study with additional physics benchmark analyses
4. Vary detector parameters, each conceptual design
radius, sampling frequency, segmentation
5. Compare of results leading to optimal design for each concept

Global Detector Design

Simulation Work Package	FY'05				FY'06				FY'07			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
1 st benchmark study, 1 concept			=	=	=							
Analysis of alternative detector concepts				=	=							
Additional physics benchmarks					=	=	=	=				
Vary detector parameters, all concepts							=	=	=	=		
Comparison of results, optimisation				=	=	=	=	=	=	=	=	=

Task 5.3: Support of other WPs

Differs from other tasks - services requests from other WPs as necessary - flexible schedule

- ▶ Study impact of DAQ design on local clustering, & etc.
- ▶ Simulations of mechanical imperfections
- 1. Add MAPS geometry to Mokka / SLIC
Few wafer tests and whole detector
- 2. MAPS sensor variation studies (pixel characteristics)
- 3. MAPS test beam
- 4. ...+ongoing requests, e.g. acceptable dead areas, etc.

Support of other WPs

Simulation Work Package	FY'05				FY'06				FY'07			
	1	2	3	4	1	2	3	4	1	2	3	4
Study of DAQ on local clustering				=	=	=						
Studies of mechanical imperfections			=				=		=			
Implement MAPS in Mokka / SLIC	=	=	=									
MAPS sensor variation studies			=	=	=	=	=					
MAPS test beam										=	=	=
... + other ongoing requests ...												

Task 5.4: Physics Studies

1. Define aspects of detector to be tested
Intrinsic resolutions, particle separation
Define set of complete physics benchmark processes
2. Implement simple, robust version of single analysis using generic tools
Does **not** have to be “state-of-the-art”
3. Develop **additional** physics benchmark analyses
4. Understand **interplay** between **hadronic modelling** uncertainties and **energy flow**

Physics Studies

Simulation Work Package	FY'05				FY'06				FY'07			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Define complete physics benchmarks	=	=										
Implement robust analysis with generic tools		=	=	=								
Additional physics benchmark analyses				=	=	=	=	=	=			
Investigate role of hadronic modelling					=	=	=	=	=	=	=	

Future Simulation Summary

- The deliverables after 3 years will *include*
 1. Code for generic energy flow algorithm
 2. Significant contributions to detector CDR and TDR
 3. Positions of responsibility in global LC software activity
 4. Report on simulations for other WPs (MAPs, DAQ, Mech.)
 5. Framework for physics analysis benchmarking of detector designs

Planning for Simulation and Physics

- Review plans as per proposal
- Evaluate scope/schedule/effort changes
- **Adapt** post-Snowmass and in light of developments since 14-Jan-2005
- Have to make significant progress before LCWS'06
- Suggest "kick-off" meeting for all interested at (or close to time of) next LCUK at UCL, 05-Oct-2005
 - ▶ Date to agree by email (or now?)
 - ▶ More info. on who/when by end Sept.
 - ▶ New RAs (Bham/Imperial/Cambridge) recruited soon
 - ▶ Be **realistic** in what we can do