A detector R&D proposal to the EU

Ties Behnke, DESY

Goal:

This proposal aims at strengthening a coordinated European effort towards research and development of the next generation of large-scale particle detectors. New and advanced detector technologies are mandatory to fully exploit the potential of future high energy colliders like the International Linear Collider (ILC) which is being designed in an emerging world-wide collaboration[1]. We propose a programme to facilitate experiments and to enable an analysis using shared equipment and common tools. We will employ existing facilities and plan to improve them as required. Thus the goal is to establish a common European infrastructure for the research on advanced detector concepts for the ILC and to foster collaboration between the European partners and the associated institutes.

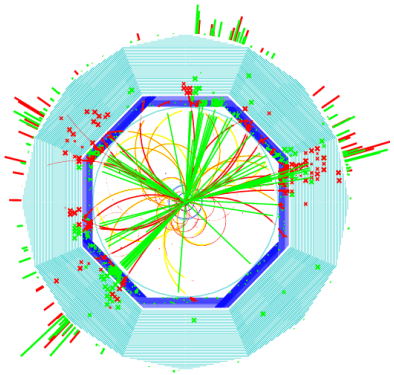
[1] In this context the European Union is supporting the projects CARE, EUROTEV and calorimeter R&D in the ISTC framework

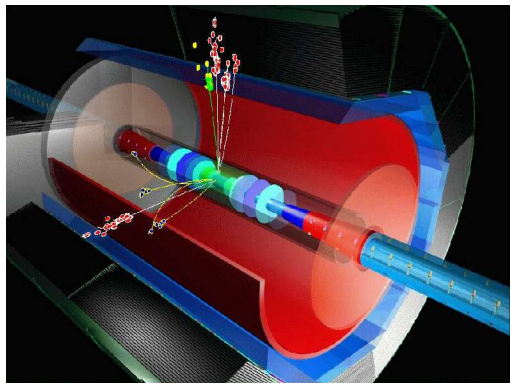
detector R&D for the ILC

precision physics: precision detectors

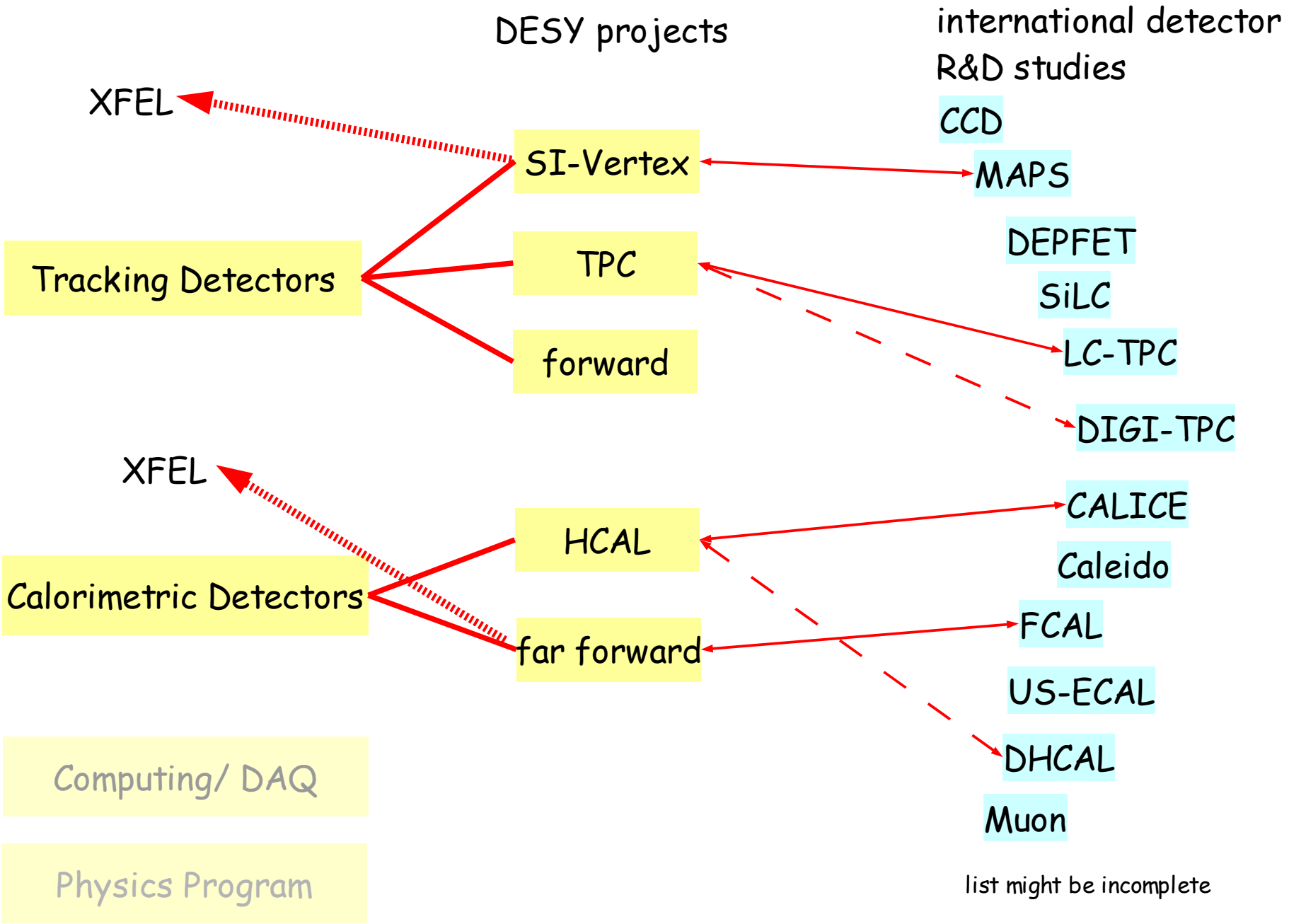
novel technologies are needed in many areas

vertexing: unprecendented precision, very thin detectors, readout during a ILC train, etc.
tracking: next generation TPC as main tracker, novel readout technologies, factor 10 better resolution
calorimeter: ready for particle flow reconstruction





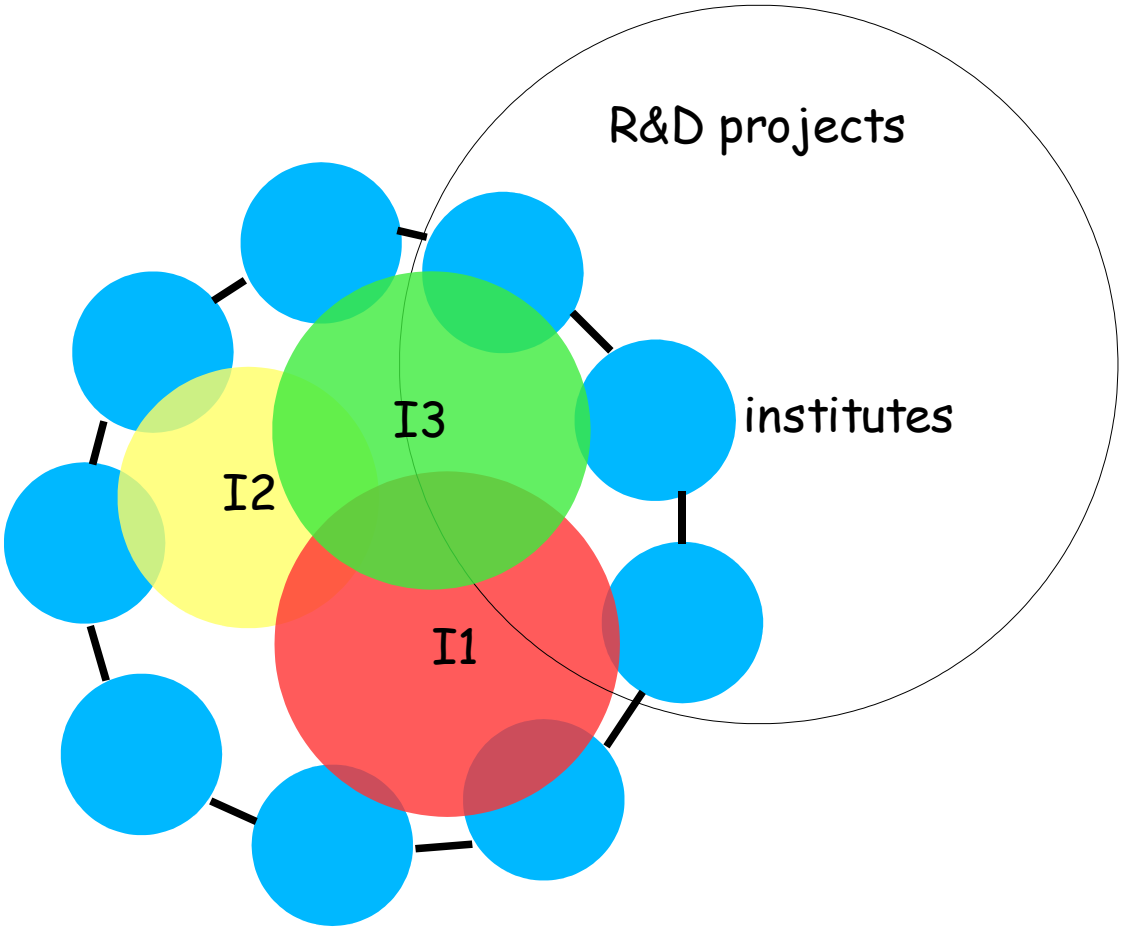
Detector R&D: the current state



Why an EU proposal

position the european community to play an important role in this R&D

make available and improve the infrastructure needed to do detector R&D



Program

Improvements of infrastructure:

- test beam infrastructure/ instrumentation

  fixed location: DESY test beam infrastructure

  mobile installation: High field magnet, precision hodoscope

- prototype infrastructures

  provide protytpe structures for major hardware components
  to allow improvement programs for detector technologies
  - calorimeter
  - TPC
  - SI tracking

R&D program

Improve the calorimeter systems through

- improved readout systems (electronics, DAQ, data management)
- novel readout systems

Improve the TPC system through:

- improved TPC field cage structures to be used within the test infrastructure
- improved readout electronics and DAQ
- improved readout structures

Improve the SI tracking system through

- improved SI detector testing and production facilities
- improve access to existing facilities
- improved sensor development

Networking

Create a European Network of ILC related detector R&D groups

include the main players in the field

intensify the cooperation and exchange, in particular in the area of infrastructures

be totally open to external contributions and cooperations

Access:

Through transnational access make the infrastructures available to non-members of the EU project

Ensure the international aspect through this mechanism

Current plans

Countries who have expressed an interest:

Czech, France, Germany, Netherlands, Poland, United Kingdom

with a total of around 20 institutes so far

be careful: number are very preliminary and approximate!

JRA	Person power	Costs	Total costs	Contribution participants	Request
Testbeam infrastructure	7 FTE	700	2800	1625	**1175**
TPC R&D	8 FTE	850	3250	1250	**2000**
Calorimeter R&D	7 FTE	475	2575	1350	**1225**
Silicon Vertexing	10 FTE	240	3240	1600	**1600**
Networking	2 FTE	380	930	460	**470**
Transnational Access	0.5 FTE	420	570	290	**280**
Sum	**34.5 FTE**	**3065**	**13365**	**6575**	**6750**

Conclusion

We seem to have a critical mass to proceed

Feedback from Bruessel has been guardedly positive so far,
but we are still waiting for more specific advice

We will decide finally early next week whether we will go ahead or not

The important question: what should be the acronym?