

Experience with Co-Design in Academic & Industrial Projects





SOS 18 Workshop, 19.3.2014, St. Moritz

Dr. David Müller, CEO

Vision meets reality.

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		HEP High Energy Physics	HPC High Performance Computing	Embedded Computing
Research	Academia			
	Industry			

Co-Design in HEP

A huge Instrument for just one Scientific Question

Vision meets reality.

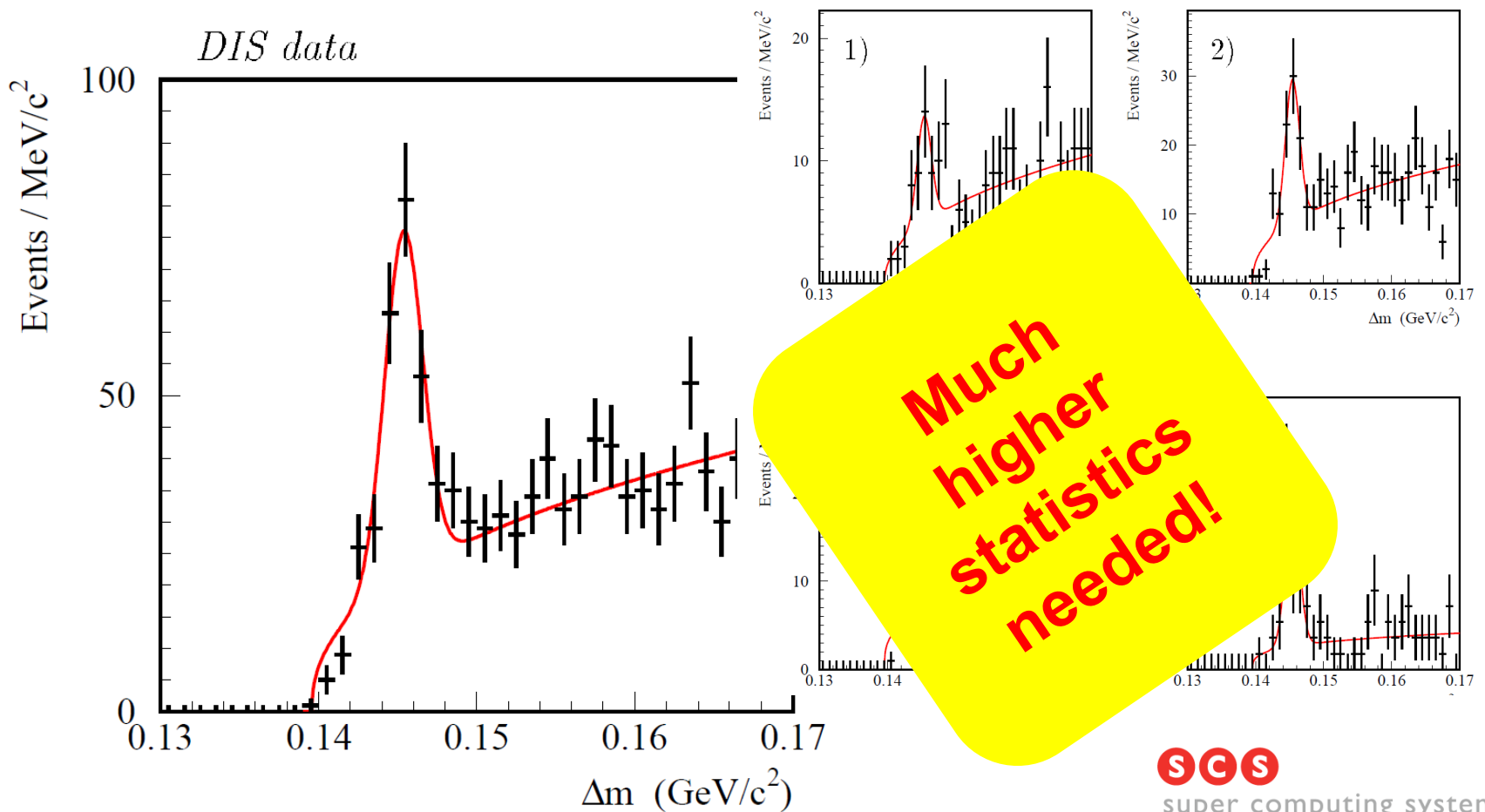
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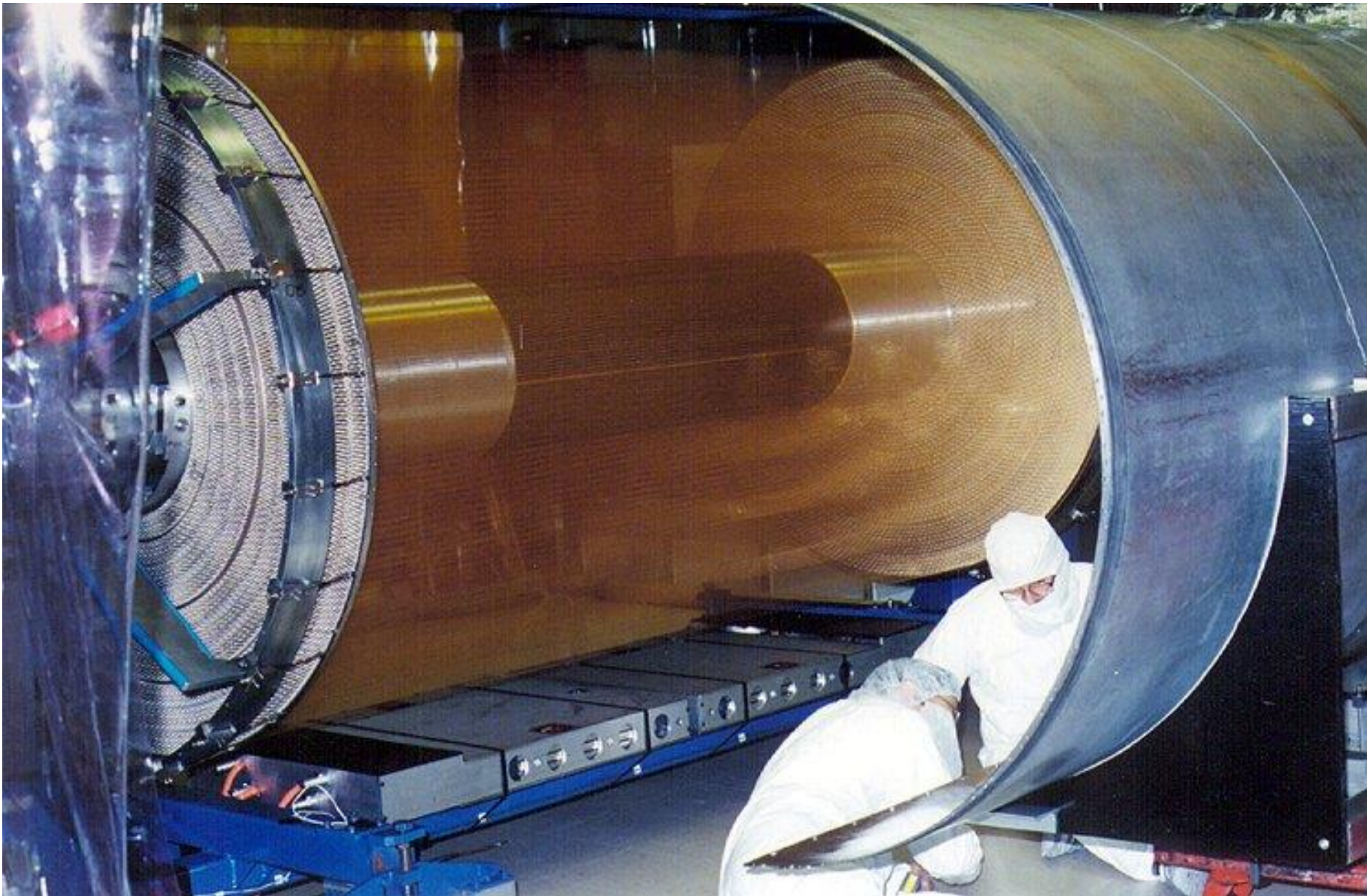
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H1 Collaboration, March 1994 @ DESY



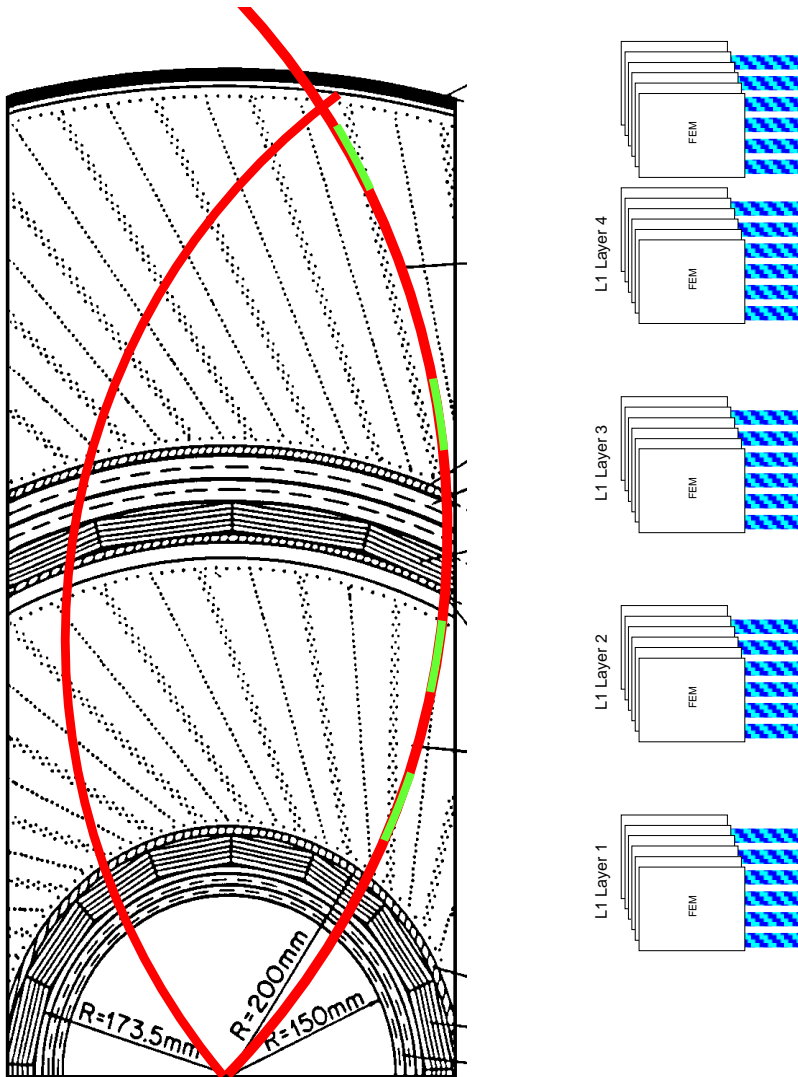
**Scientific Goal of my PhD Thesis (1998):
Derive the Proton Structure from
Observed Charm Production Cross Sections from
Reconstructed Charmed Meson Decays from
Measured Charged Particle Tracks**





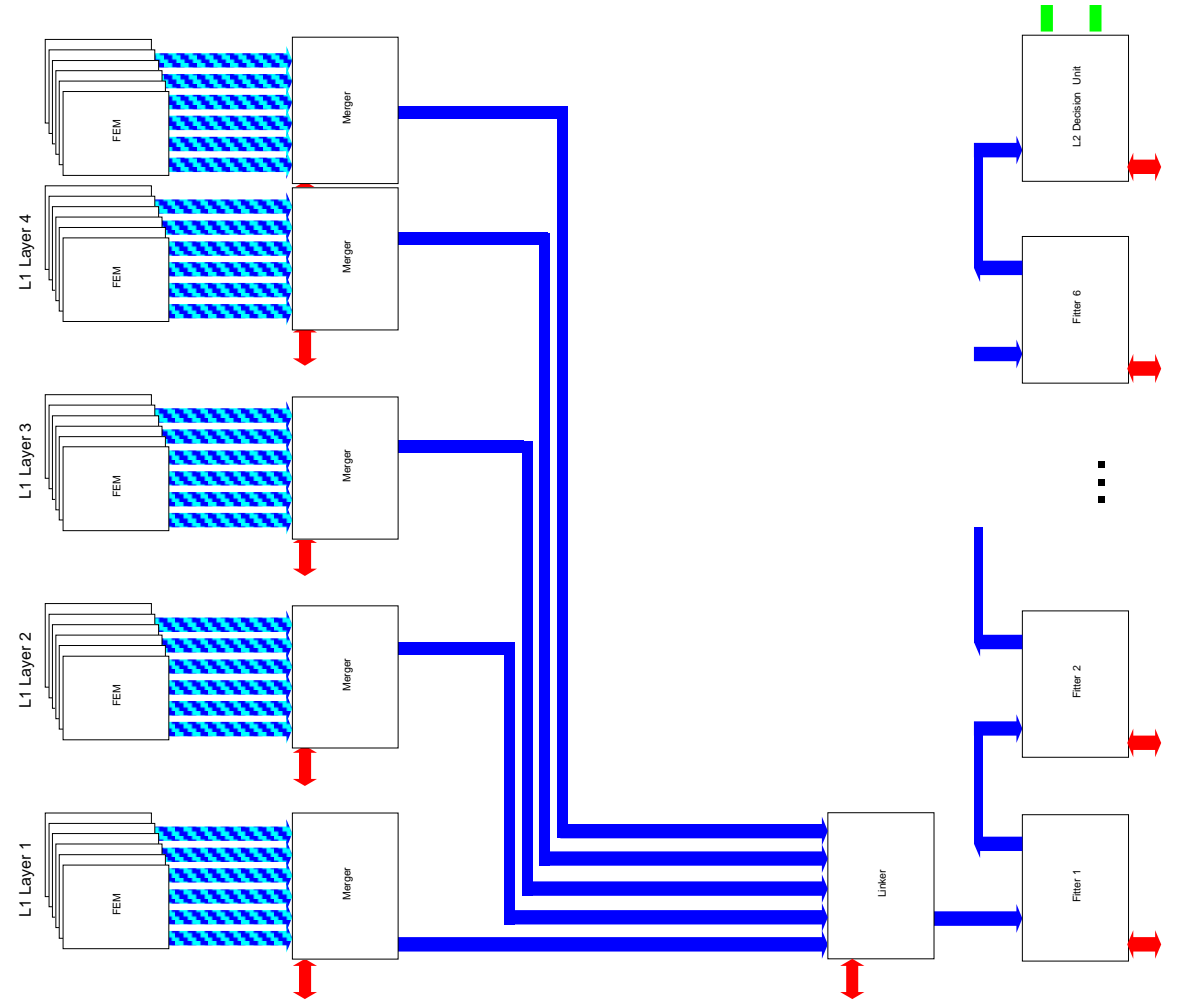
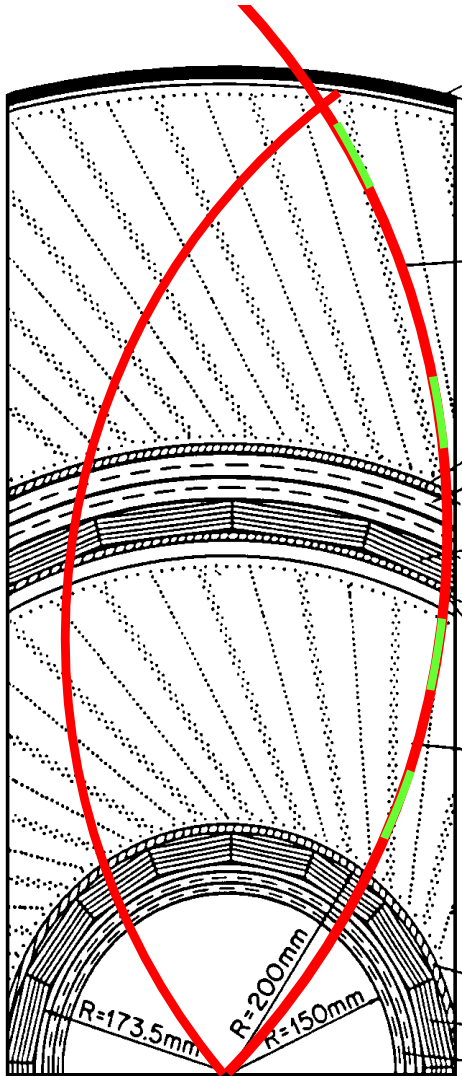
Track Reconstruction

Event Selection within 2.2 μ s \rightarrow Fast Track Trigger

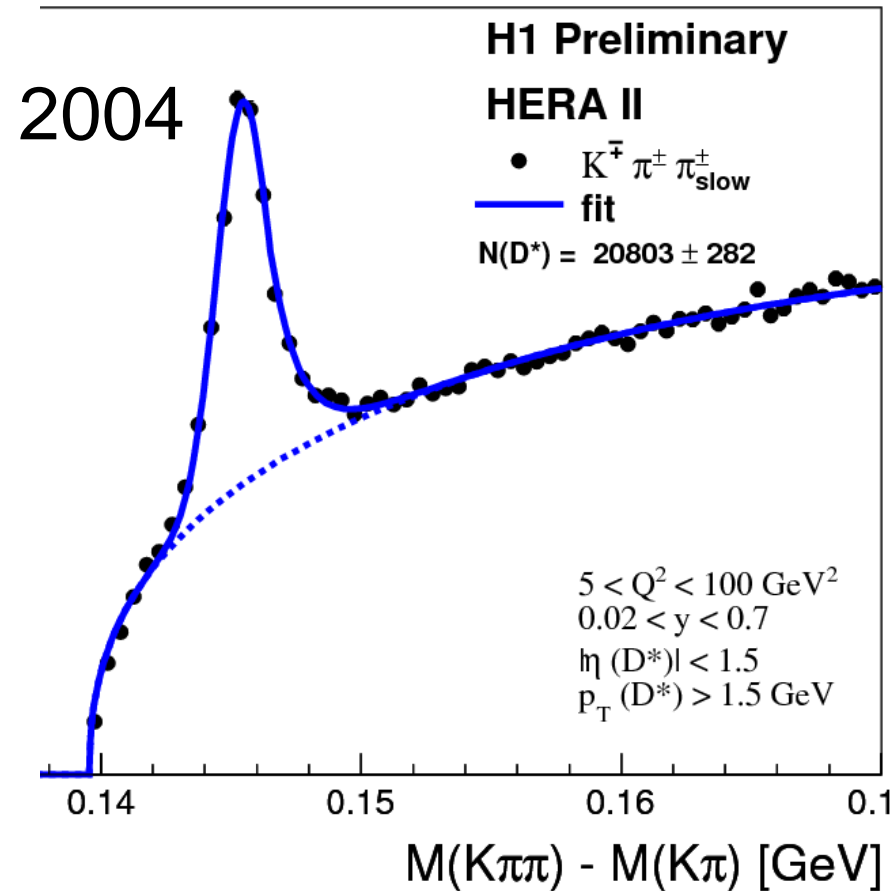
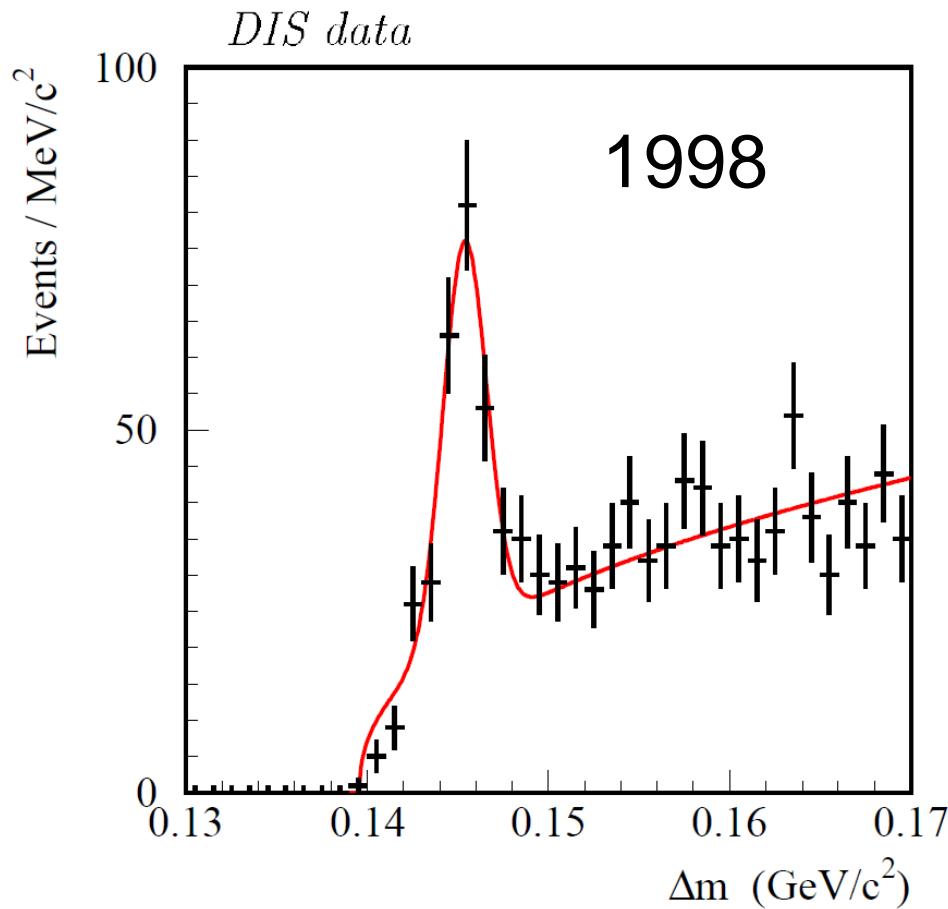


Track Reconstruction

Event Selection within 2.2us → Fast Track Trigger



Scientific Result: Much More Precise Measurements



Co-design @ High Energy Physics (Fast Track Trigger)

Researchers have	Industry partners have
Need	
Understanding of the detectors & algorithms	Experience from other fields
Ideas	Practical solutions
Passion & endurance	Processes & focus
Research <ul style="list-style-type: none">• Open questions	Development <ul style="list-style-type: none">• «Until when is it done?»• «What is the cost?»

Co-Design in HPC

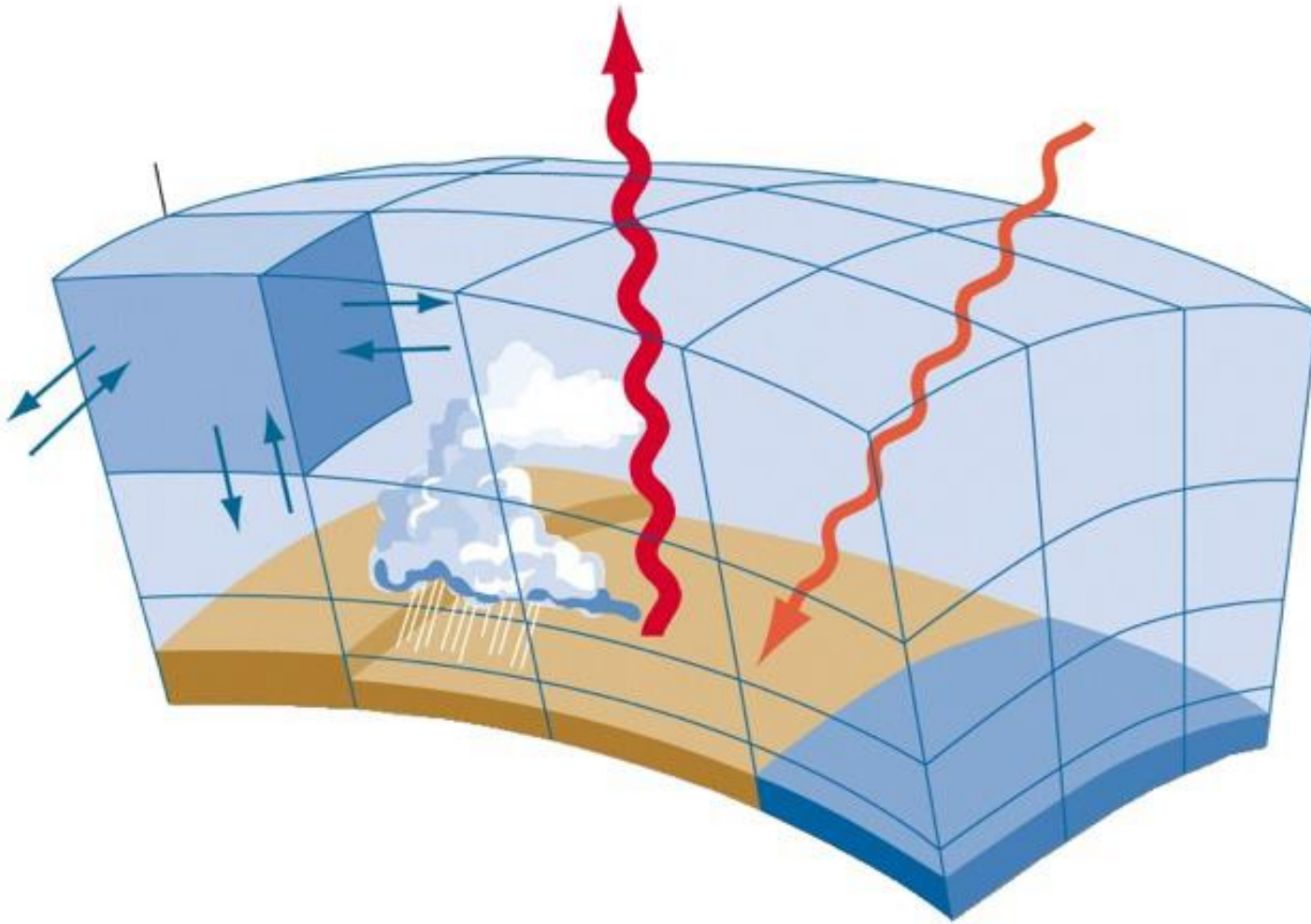
A Library for one single Scientific Application

Vision meets reality.

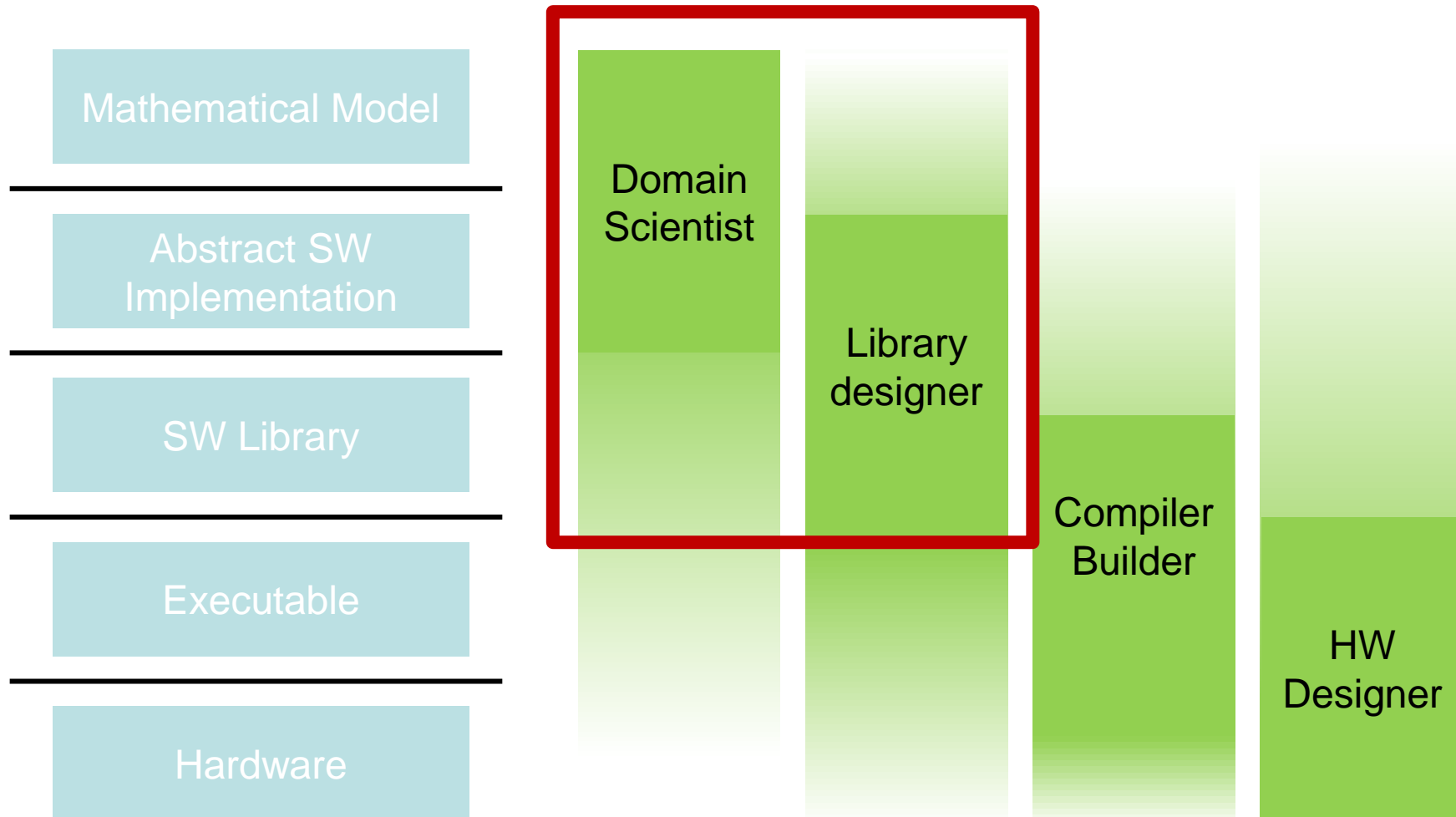
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COSMO



COSMO Dynamical Core Re-Write



Co-Design in Embedded Applications

A Device for one single Application

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Daimler – Advanced Driver Assistance System (ADAS)



Driver Assistance

Development task @ SCS:

- Port from SW model to FPGA implementation:
 - Very high level of on-chip parallelism
 - Application specific execution units
 - Feedback to algorithm design

Research



Devel.



QA / V&V

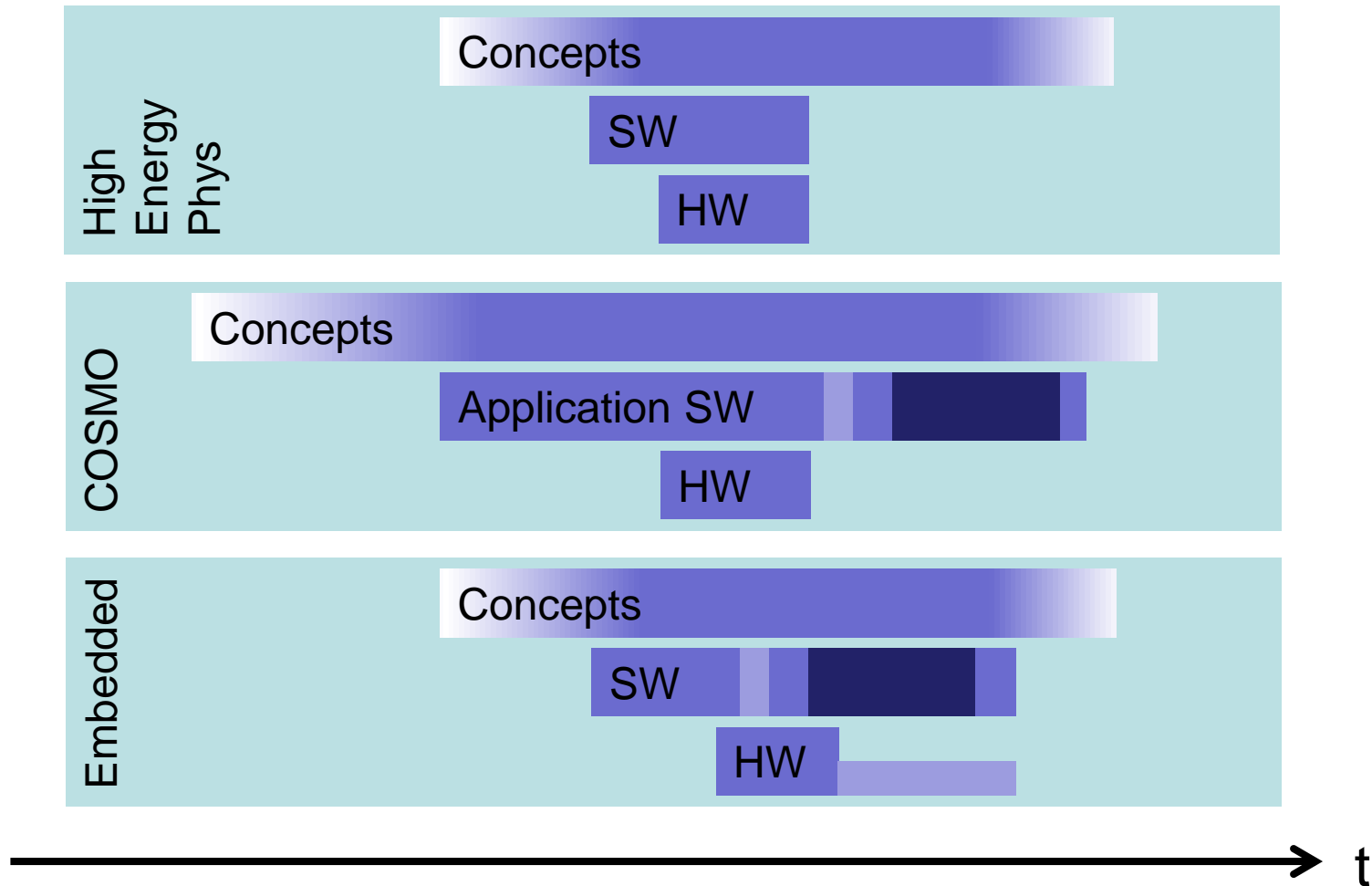


Industr.



super computing systems

Life Cycle Consideration







You are kindly invited to visit us in
Zurich Technopark. Just let me know!

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