

Brainstorming regarding final focus options

What do we need?

What can we get?

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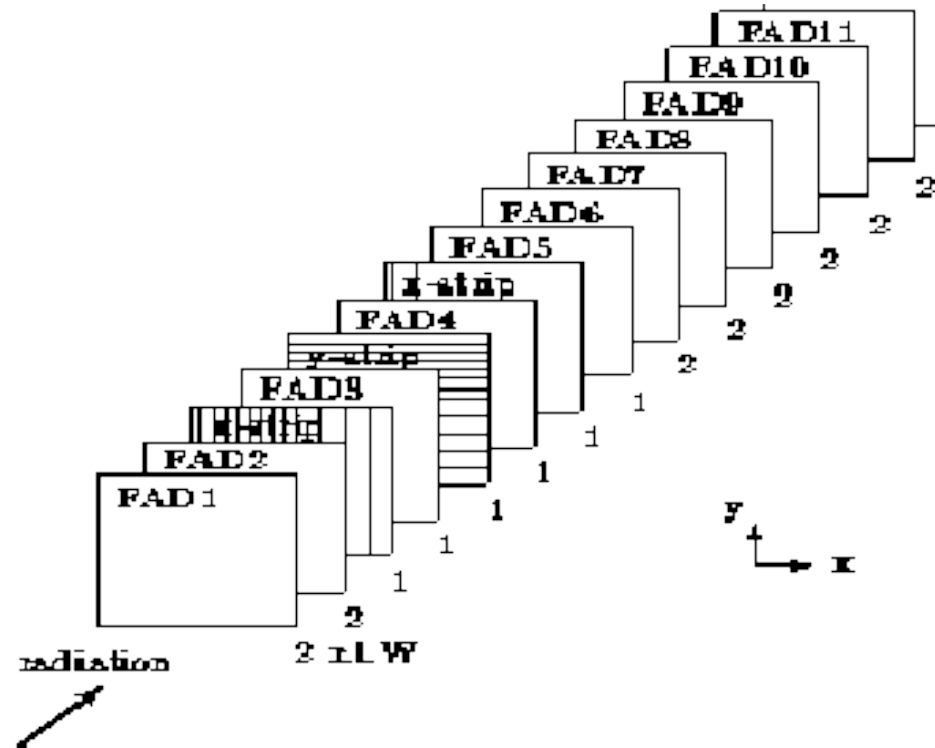
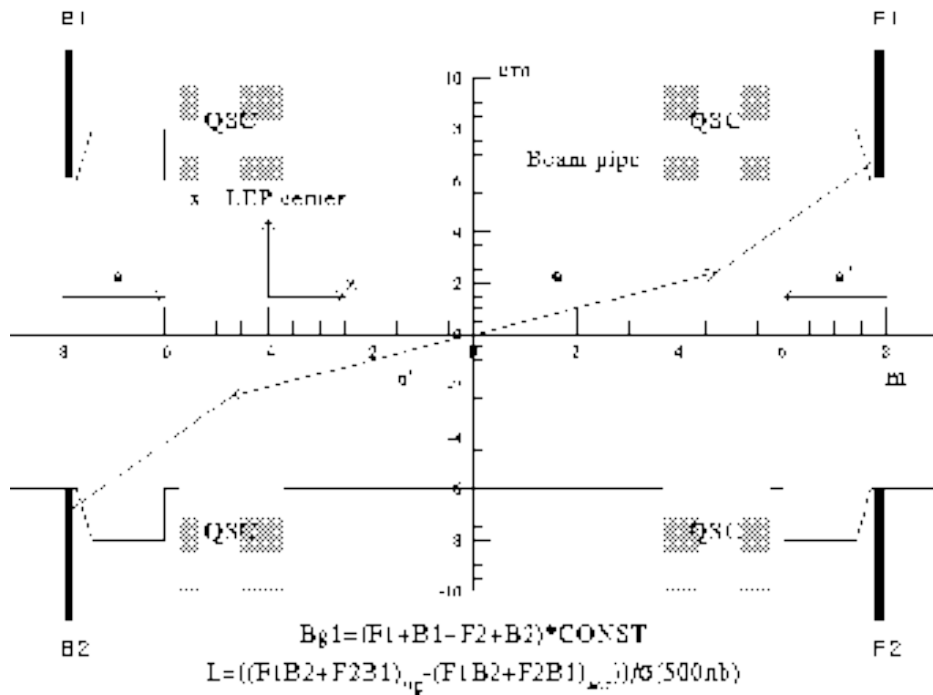
Situation at Delphi at LEP

Delphi had a:

- silicon vertex detector
- A small angle tagger (SAT) replaced by the small angle tile calorimeter (STIC) for absolute luminosity determination
- and a very small angle tagger (VSAT) *after* the last FF quad for relative luminosity determination
- A final focus superconducting quadrupole (QSC) 4m from the IP

Reminder: DELPHI and VSAT

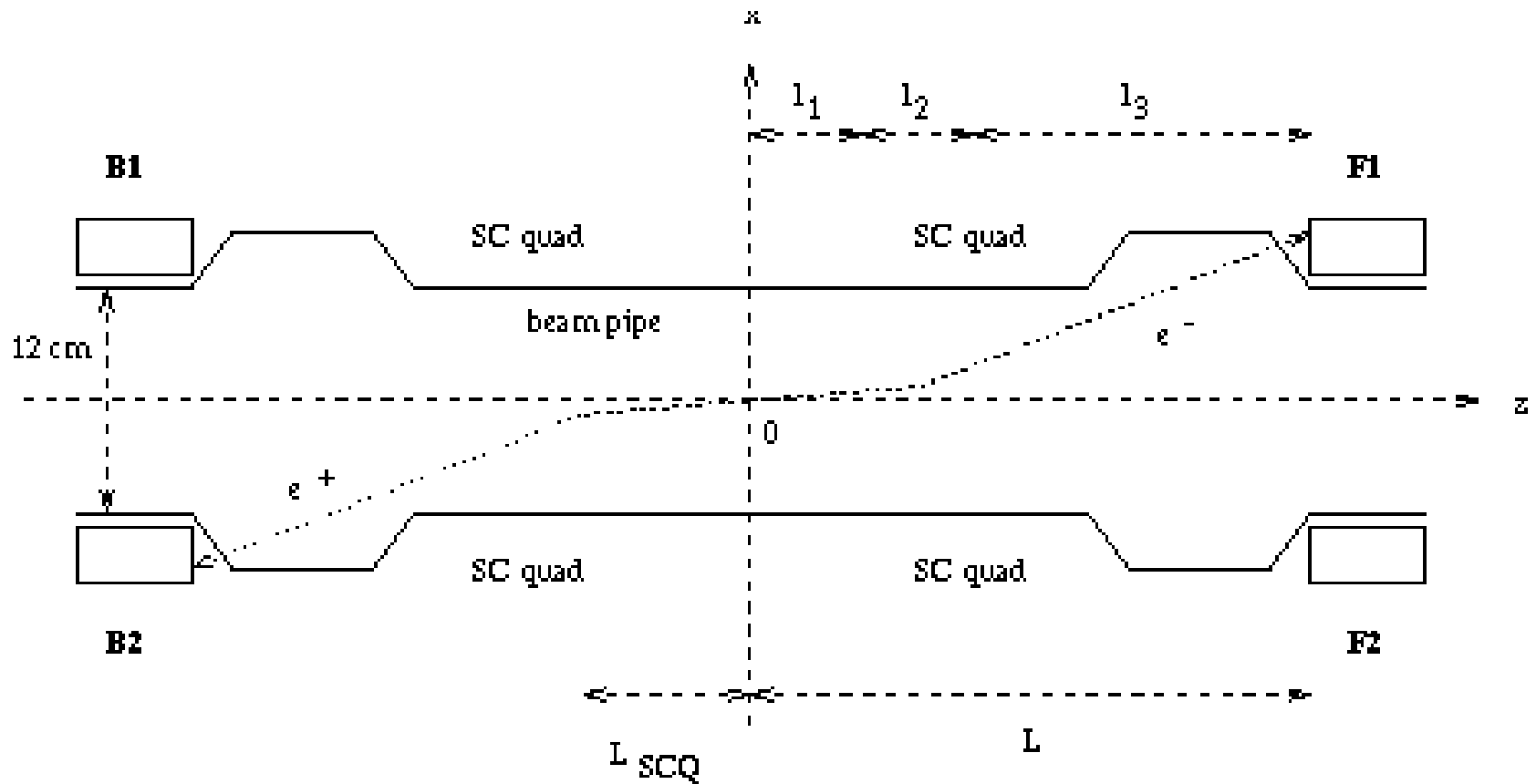
DELPHI Very Small Angle Tagger



QSC was at $L^* \sim 4m$

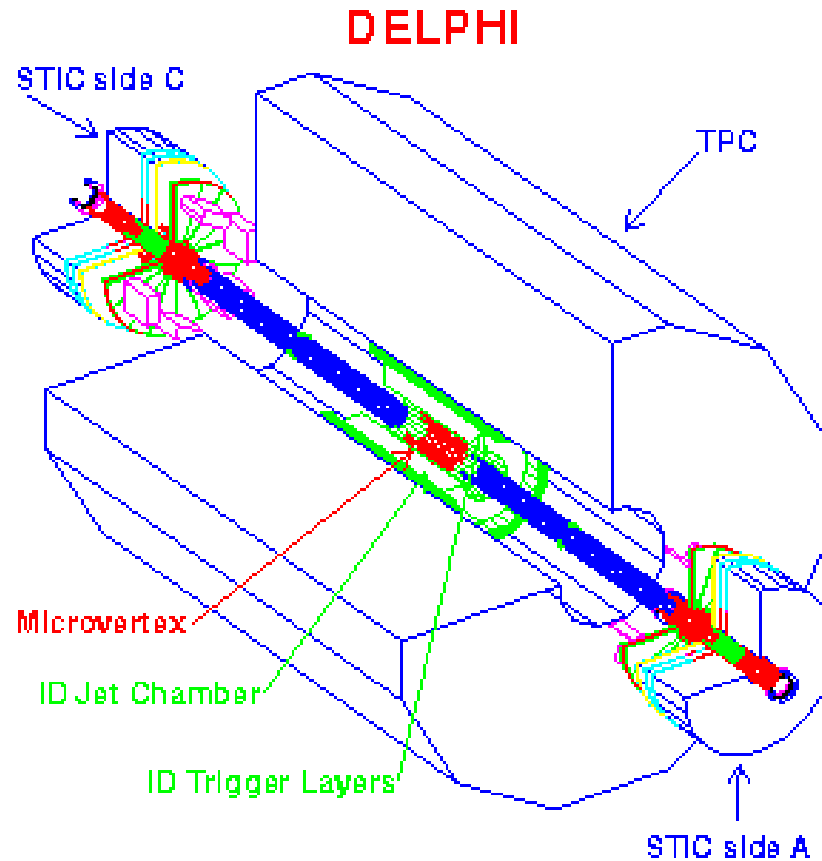
VSAT placed 8m from IP

VSAT location – x view



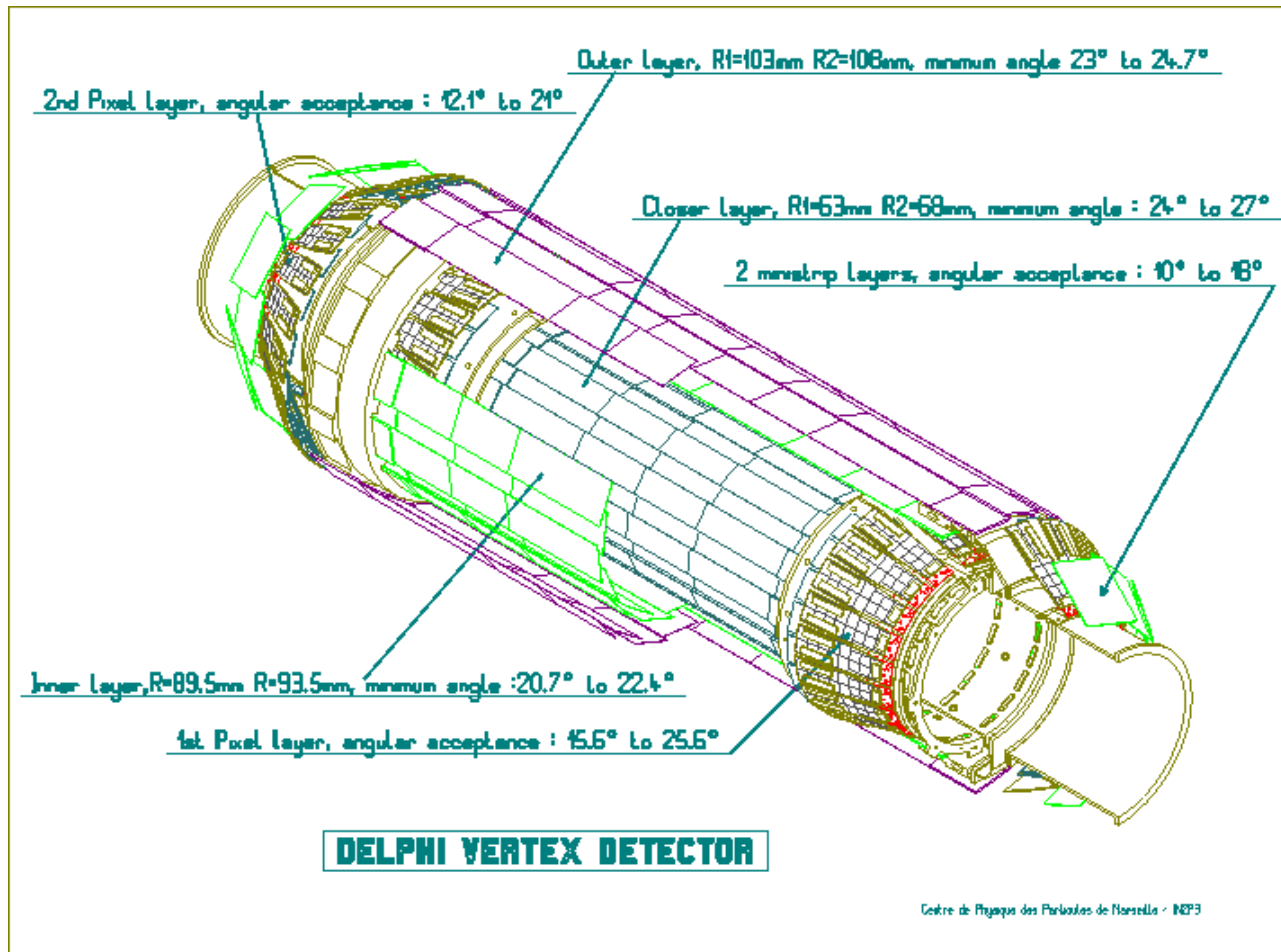
Beam pipe: 12cm diameter

The DELPHI STIC



two cylindrical detectors placed on either side of the DELPHI interaction region at a distance of 220 cm, covering an angular region between 29 and 185 mrad in polar angle (from 6.5 to 42 cm in radius).

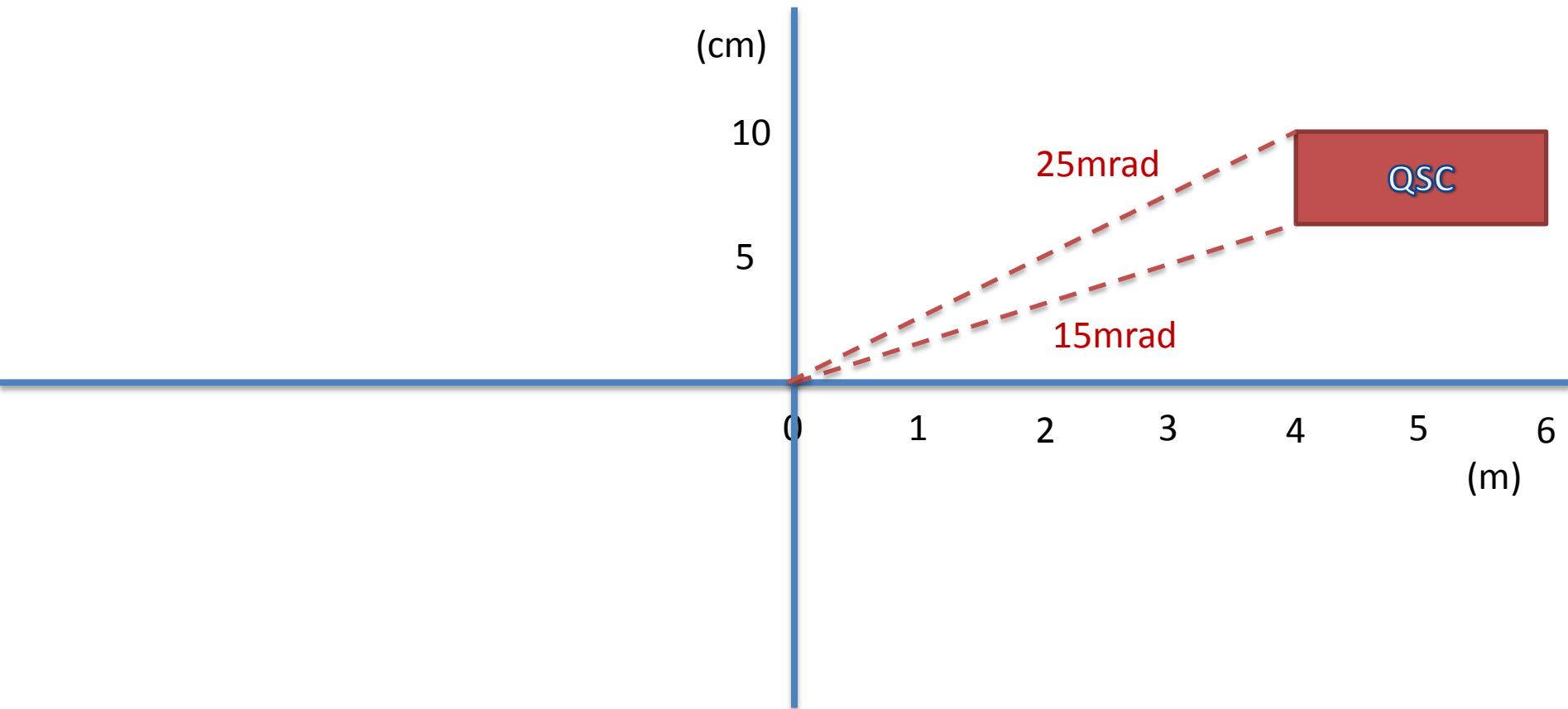
The DELPHI silicon tracker



Innermost layer at $R=63\text{mm}$

recap

- DELPHI beam pipe: 12cm diameter
- QSC 4m from the IP, next to beam pipe
- Angle of last quadrupole: 15mrad



The current status of the TLEP FF effort

- First attempt with L^* of 3.5m does not yet work (one needs a lot of improvements):
 - Momentum acceptance (especially at the –ve side) is only $\sim 0.5\%$
 - Dynamic aperture insufficient
- But beam size at 15 sigma at the quadrupole is $\sim 10\text{mm}!!$

mitigation

- We have three mitigation scenarios:
 - We relax the condition on L^* (3.5m)
 - We relax the condition on Beta^* (1mm)
 - We do none of the above and try harder
- Relaxing the condition on beta^* (for me personally!) is not an option as it directly affects the luminosity

L^* of 2m

- We have tried to change the position of the last quadrupole – move it closer to the IP – from 3.5m to 2m
- This improves dynamic aperture, but not the momentum acceptance
- It is currently not clear if this is the way to go (might be!)

Strategy

- We would like to find a (non-ideal perhaps) point which we can prove that works
- We then will try and move (adiabatically?) towards our goal of $\beta^*=1\text{mm}$, $L^*=4\text{m}$

This is work in progress.
Please stay tuned for news