

Vacuum

From DAΦNE to DAΦNE2

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10-13/09/2003

Workshop on e^+e^- in the 1-2 GeV
range

Outline

- DAFNE
- Two hypothesis
- Technical issues
- Costs
- Man Power
- Conclusions

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DAFNE

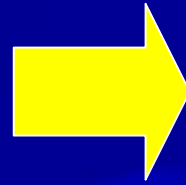
- 510 MeV
- 5.3 A
- 50 kW
- $3 \cdot 10^{21}$ phot./s
- $1 \cdot 10^{-9}$ mbar



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DAFNE



DAFNE2

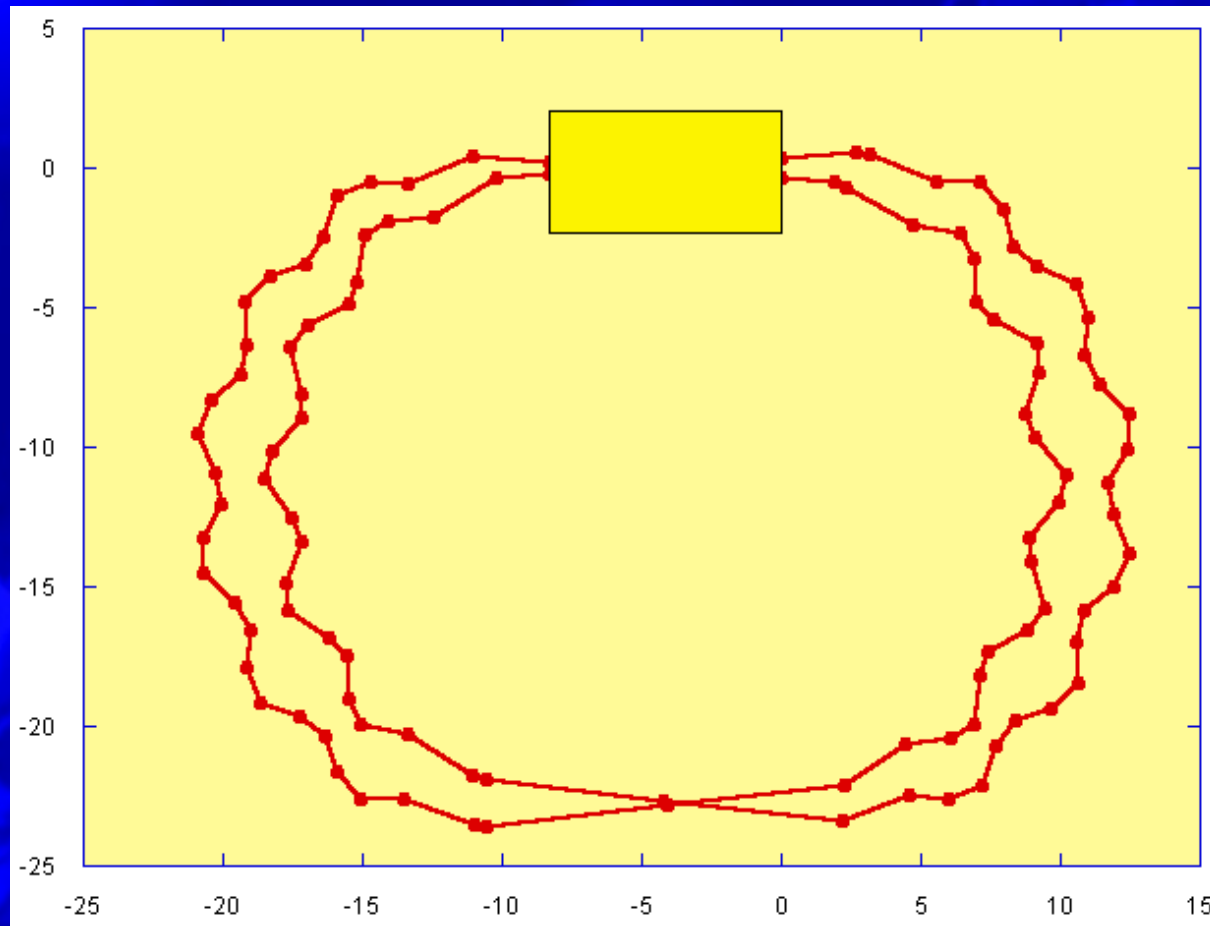
- High Luminosity

- 510 MeV
- 3.6 A
- 130 kW
- $8 \cdot 10^{21}$ phot./s
- $1 \cdot 10^{-9}$ mbar

- High Energy

- 1.1 GeV
- 0.5 A
- 45 kW
- $7 \cdot 10^{20}$ phot./s
- $1 \cdot 10^{-9}$ mbar

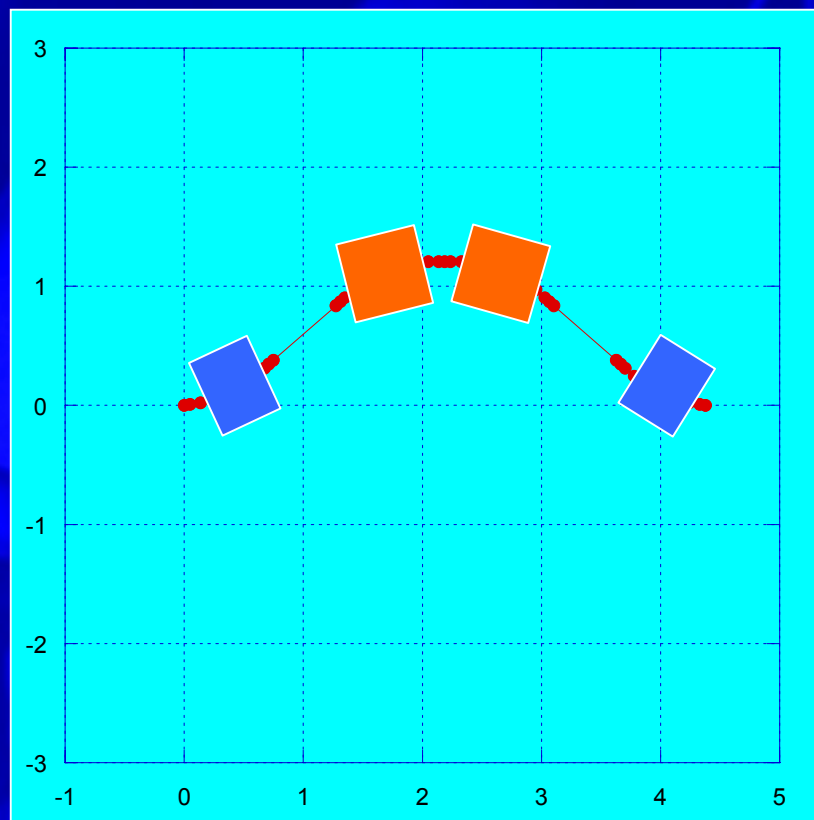
High Luminosity



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High Luminosity



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High Luminosity

- Synchrotron radiation
 - $N_{\gamma} = 8.1 \cdot 10^{21}$ phot. s^{-1}
 - $P_{\text{tot}} = 130$ kW

High Luminosity

- Vacuum System

- Total gas load

$$Q = 3.2 \cdot 10^{-4} \text{ mbar l s}^{-1}$$

- Working pressure

$$P = 1 \cdot 10^{-9} \text{ mbar}$$

- Installed pumping speed

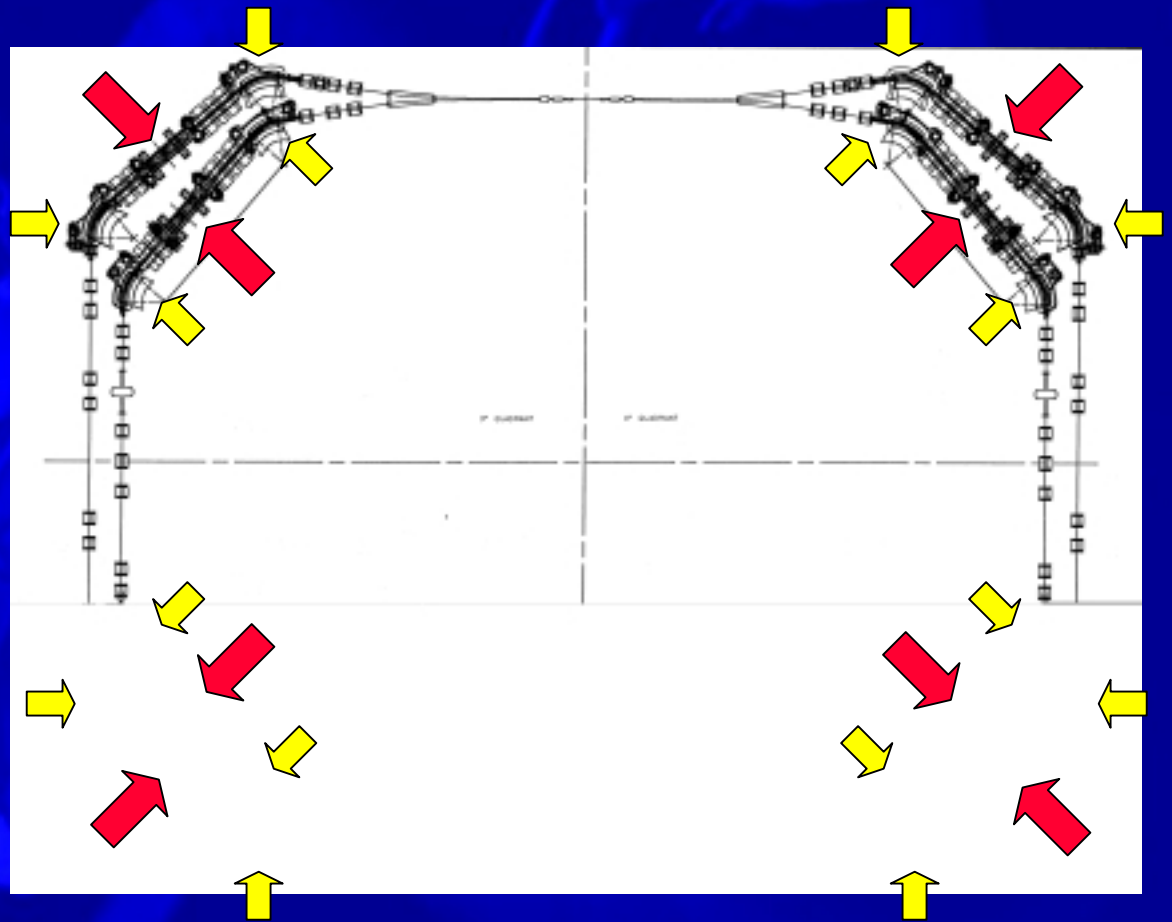
$$S = 3.2 \cdot 10^5 \text{ l s}^{-1}$$

High Energy

DAΦNE like

2.2 T
Bendings

1.8 T
Wigglers



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High Energy

- Synchrotron radiation
 - $N_{\gamma} = 7 \cdot 10^{20}$ phot. s^{-1}
 - $P_{\text{tot}} = 45$ kW

High Energy

- Vacuum System

- Total gas load

$$Q = 2.8 \cdot 10^{-5} \text{ mbar l s}^{-1}$$

- Working pressure

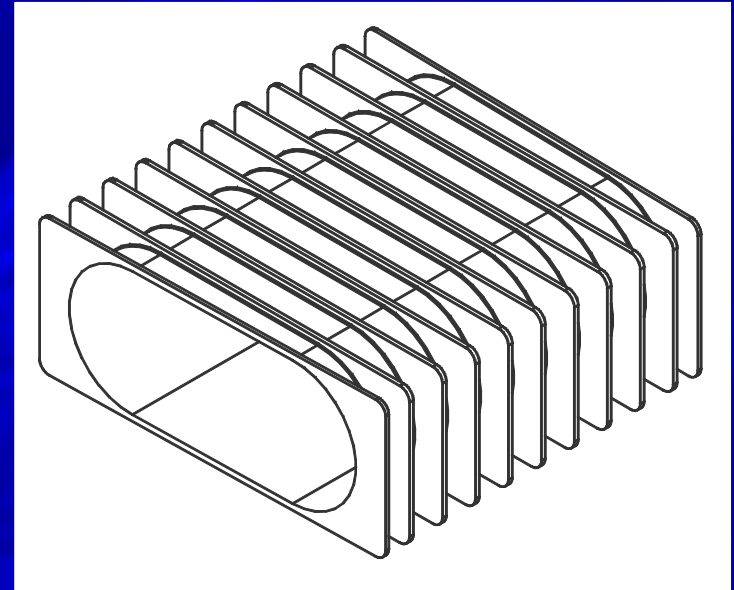
$$P = 1 \cdot 10^{-9} \text{ mbar}$$

- Installed pumping speed

$$S = 2.8 \cdot 10^4 \text{ l s}^{-1}$$

High Energy

- Energy ramping
 - Ramping rate
- Eddy currents
- Thin vacuum chamber



Costs

High Luminosity

7 M€

High Energy

Up to 4 M€

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Man Power

High Luminosity

10 man year

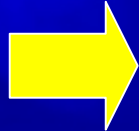
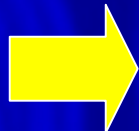
High Energy

5 man year

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Conclusions

- Both are feasible
- High Luminosity  A new machine
 - More demanding on costs and man power
- High Energy  DAΦNE upgrade
 - Less demanding on costs and man power