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1 Organization (mainly question marks)[1]

- How do we arrive at a real working group ?
- What will be studied ?
- How should the work be organized ?
- How should the group communicate ?

[1] produced late at night, so please have mercy

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1.1 How do we arrive at a real working group ?

- Choose some "experts" for the various research areas, presently:

Yannis Semertzidis	EDM's, g-2
Martti Raidal	LFV theory
A.v.d.S.	LFV experiment

More may be needed.

- These experts try to activate workers in their area in- and outside the list of people that signed up this week.

- What would be an ideal size of such group ?

1.2 What will be studied ?

- Do we want to include the neutrino sector, at least in the theory part ?
- I'd like to include CC flavour universality. This can be tested in W, K, π and τ decay and was addressed in two theoretical presentations.
- CP violation in the charged lepton sector ?
- What else ?

1.3 How should the work be organized ?

- Do we start two weeks before each CERN meeting or do we want more ?
- Should subWG's meet on their own and send representatives to CERN ?
- Theory and experiment should stay together.

1.4 How should the group communicate ?

- **These meetings would probably use VRVS.**
- **These meetings could be of more general interest, *i.e.* for NUFACT.**
- **Should we arrange for a website open to the full workshop where documents can be loaded ?**

2 What happened in WG3 ?

- **LFV theory will be discussed by Martti Raidal.**
- **Rare muon decays** — **Baldini, Mori, Kuno**
- **Rare tau decays** — **Banerjee**
- **$\mu(e) - \tau$ conversion at high energy** — **Kuno, Marchiori**
- **Neutron EDM** — **Iaydjiev, Kirch**
- **Deuteron EDM** — **Semertzidis**
- **Muon g-2 and EDM** — **Onderwater, Colangelo**
- **CP in orthopositronium decay** — **Felcini**
- **Lepton universality** — **Bryman, Pich**
- **Michel parameters in μ decay** — **Gyle**

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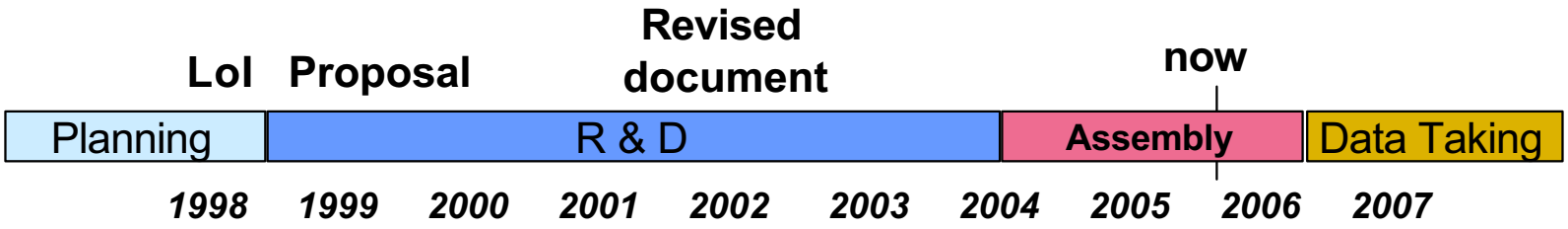
2.1 Rare muon decays

- MEG will improve $\mu \to e\gamma$ sensitivity by two orders of magnitude
- The experiment is limited by accidental coincidences and takes only a fraction of the PSI surface muon beam



- μe conversion may be the only process for which dramatic improvements in sensitivity can be achieved. After the cancellation of MECO the only remaining project is PRISM/PRIME which aims at a sensitivity of 10^{-18}.

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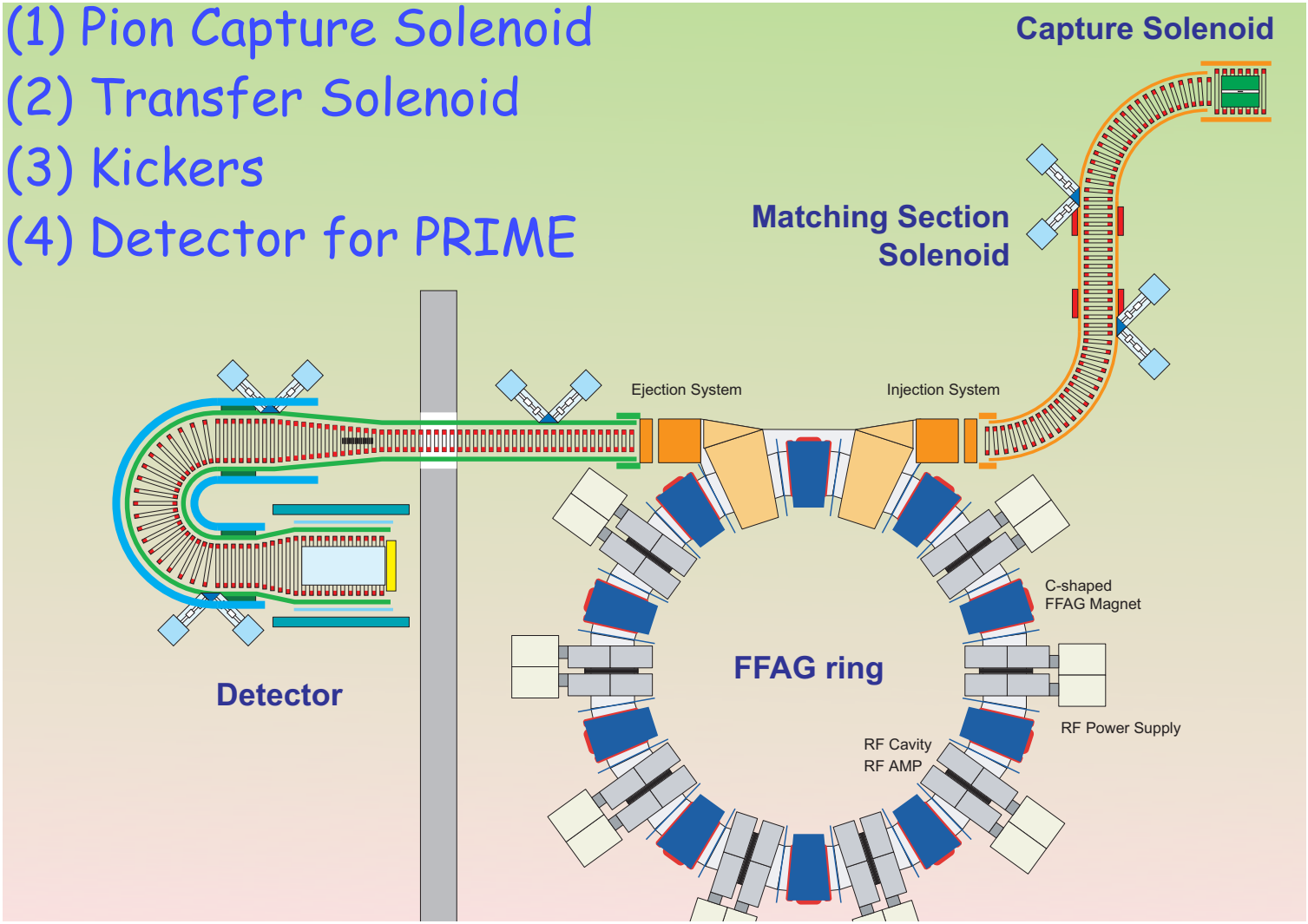
(1) Pion Capture Solenoid
(2) Transfer Solenoid
(3) Kickers
(4) Detector for PRIME



PRISM/PRIME

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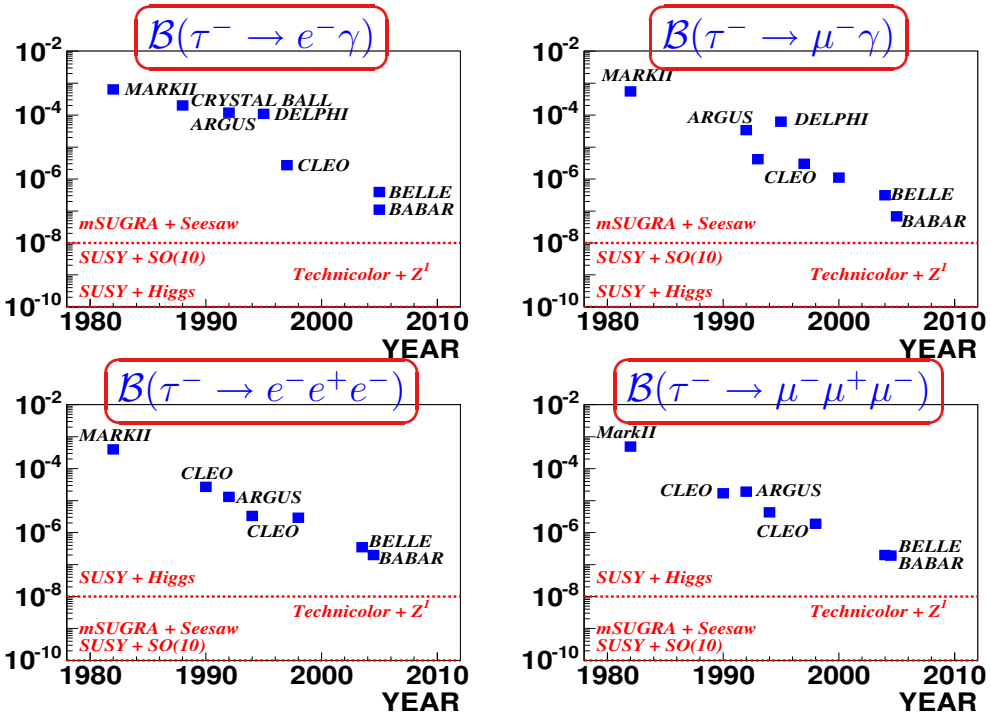
2.2 Rare tau decays



- **Further progress at the B factories not only depends on integrated luminosity but also on improvements in background suppression**
- **At the LHC $\tau \to l\gamma$ seems hopeless.**
- **$\tau \to 3l$ may be feasible but would require a special trigger**

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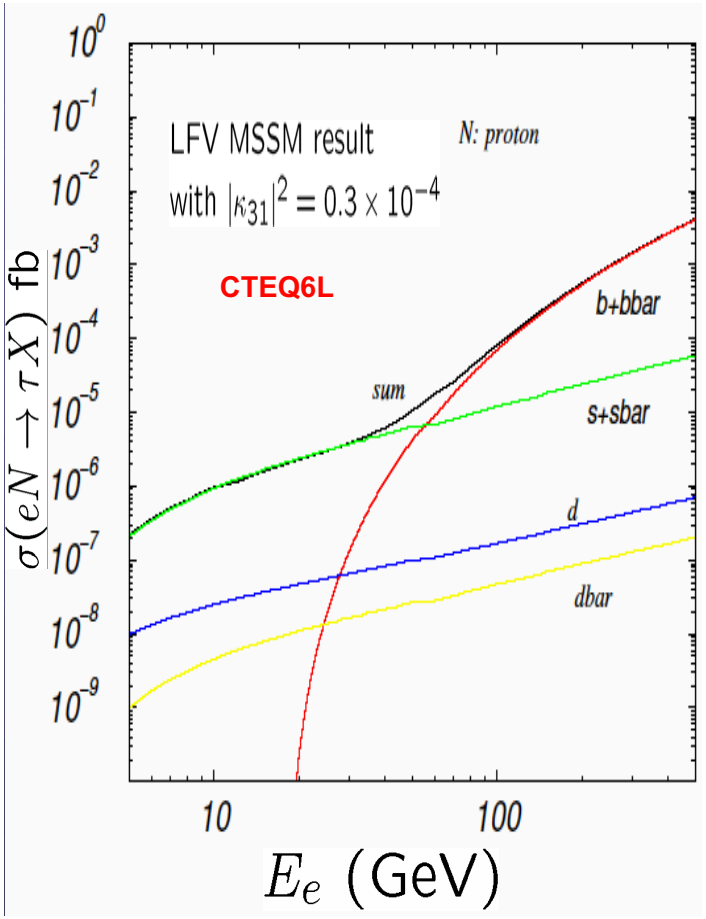
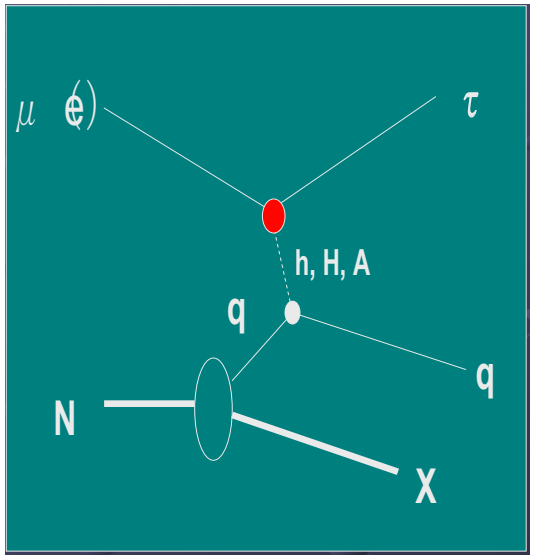
2.3 $\mu(e) - \tau$ conversion at high energy





- cross sections are assumed as large as allowed by present τ limits.

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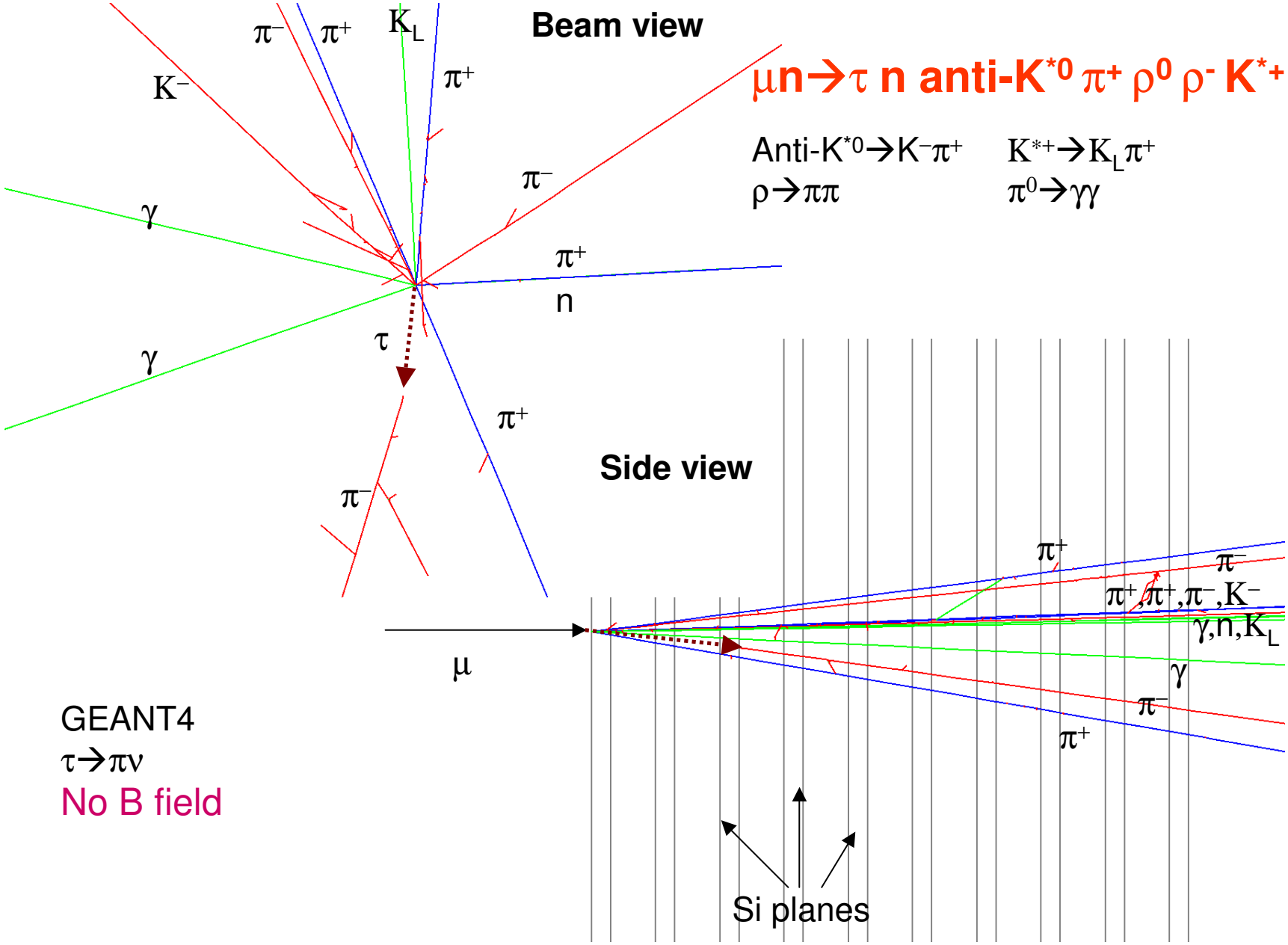

$\mu n \rightarrow \tau$ n anti-K^{*0} π^+ ρ^0 ρ^- K^{*+}

Anti-$K^{*0} \rightarrow K^-\pi^+$ $K^{*+} \rightarrow K_L\pi^+$

$\rho \rightarrow \pi\pi$ $\pi^0 \rightarrow \gamma\gamma$

GEANT4

$\tau \rightarrow \pi\nu$

No B field

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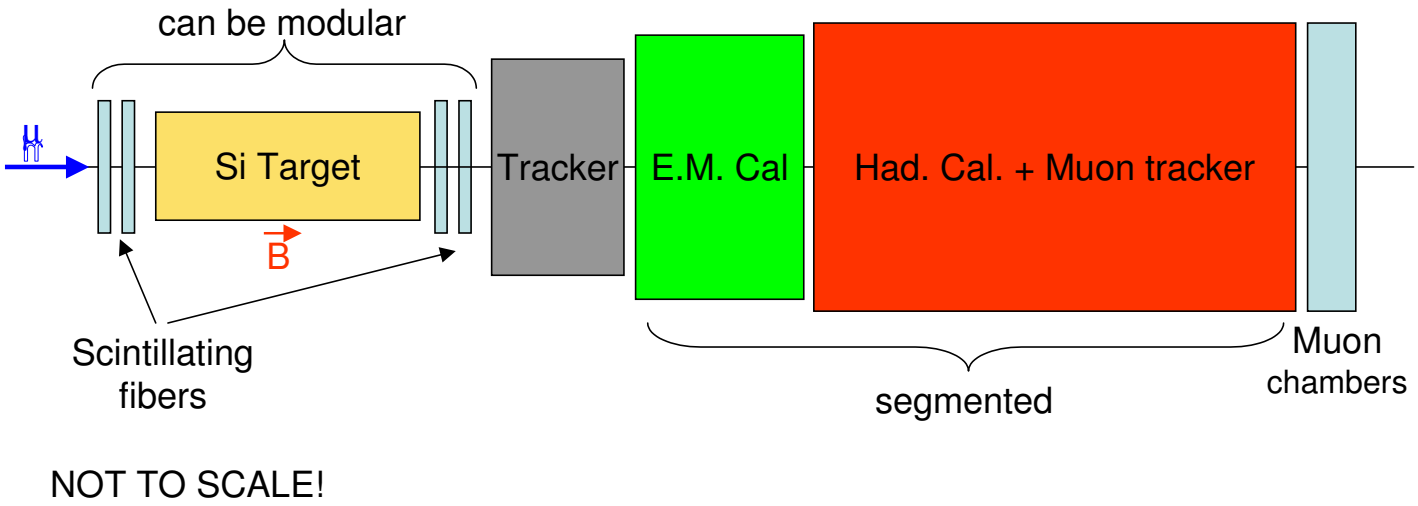
A conceptual design



- **To gain four orders of magnitude compared to the present limits from τ decay 10^{20} muons are needed.**
- **Unclear whether the detection system can stand the resulting rate in particular since these beams have low duty cycle.**

2.4 Neutron/Deuteron EDM

- The ILL experiment reached a prelimary limit of $d_n = -0.31 \pm 1.54 \times 10^{-26}$ e·cm.
- A new cryogenic version of the experiment may improve the sensitivity by 1-2 orders of magnitude in the next four years.

- The PSI experiment hopes to reach 10^{-27} e·cm in a first stage starting in 2008.

- A 10^{-29} e·cm deuteron EDM experiment is preparing a LOI. Since deuterons have electric charge the experiment can make use of a storage ring.

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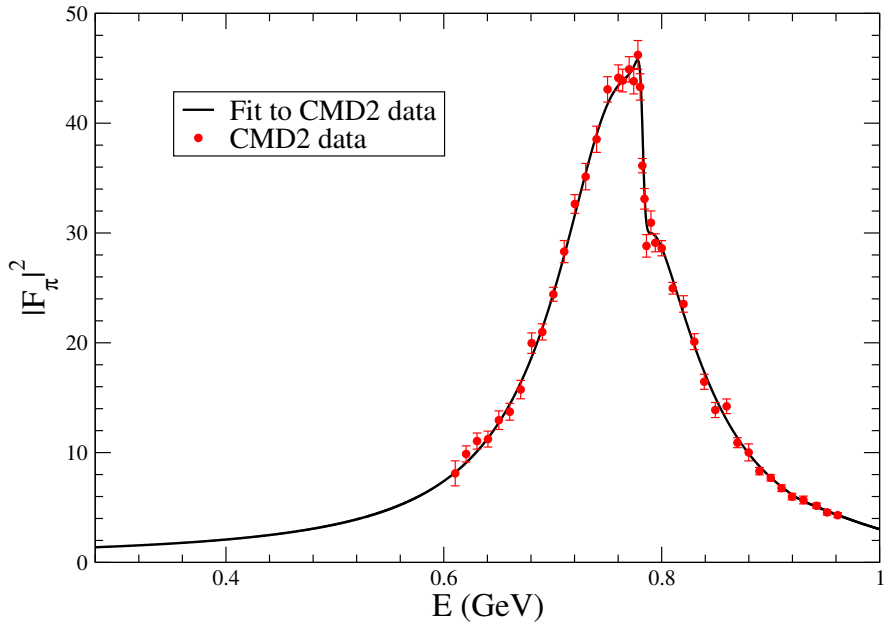
2.5 Muon g-2

- **The BNL experiment is still statistics limited**

- **There is good hope that the dominant uncertainty in the SM value originating in the uncertainty of the e^+e^- cross section data in the resonant region around 800 MeV can be reduced by a factor 2.**



Reduced statistical error in the evaluation of the integral

P	χ^2/d.o.f.	a_ρ	a_{2M_K}
0	84.0/83	420.0 ± 2.1	489.5 ± 2.2
1	75.9/82	423.4 ± 2.4	493.7 ± 2.5
2	75.8/81	423.1 ± 2.6	493.2 ± 2.8
3	73.7/80	422.2 ± 2.7	492.2 ± 2.9

GC SIGHAD (04)

Cf. Jegerlehner (03) (using the trapezoidal rule):

$$a_\rho = 429.02 \pm 4.95 \text{ (stat.)}$$

Difference in central value mostly due to FS radiation, not included in our analysis

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no conclusions...

Continuation by Martti Raidal