

Summary of session 3

Critical aspects of accelerators

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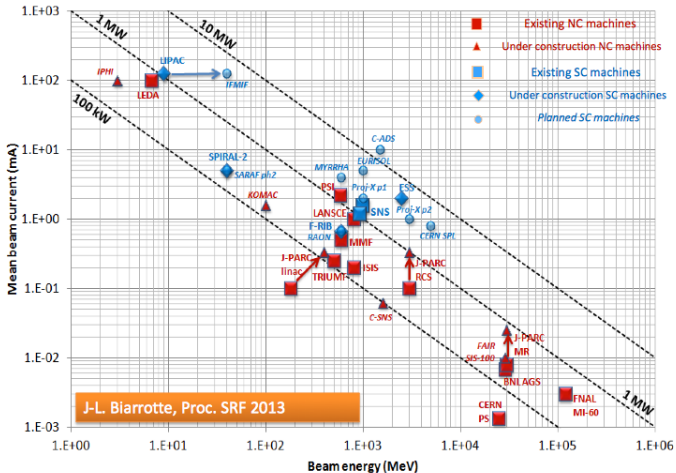
Initial question

Are we on the right track ?
A convincing answer is needed.

5 talks

1. Alex Mueller: historical basis of fundamental requirements, with a bias on how to obtain them. Emphasis on licensability.
2. Matthieu Conjat: cyclotron solution, more or less classical
 - ▶ single stage
 - ▶ SC coils
 - ▶ NC cavities
 - ▶ reverse valley field for increased flutter and no spiraling
 - ▶ compatible with H_2^+ extraction by stripping
3. Frederic Bouly: linac solution, also more or less classical
 - ▶ NC front end
 - ▶ SC booster
 - ▶ with numbers and graphs showing why the SC option is right for a CW machine
4. Roger Barlow: more exotic proposals for possible solutions
 - ▶ FFAG not applicable without small scale proof of principle
5. Peter McIntyre: cyclotron solution
 - ▶ SC cavities
 - ▶ strong focusing, stackable (multibeam)
 - ▶ “hybrid”

High Power Accelerator Projects in the World



Discussion

The old cyclotron/linac opposition is still lively and led to an amazingly strong discussion

Arguments in this opposition:

- ▶ correspondance with requirements
- ▶ capabilities for an industrial application (ability to extrapolate)
- ▶ costs incl. operation
- ▶ licensing

Requirements

- ▶ beam energy
- ▶ beam current
- ▶ reliability: fault tolerance, but also level of having well proven systems
- ▶ HE beam quality (not mentioned)

Extrapolation

- ▶ in energy: 1 GeV
- ▶ in current: 10 mA (but consider H_2^+)
- ▶ in reliability

Cost

- ▶ linac: more or less established (SNS, ESS)
- ▶ linac: 1 W/m is more than a magic number
- ▶ cyclotron: claiming a lower cost ...
- ▶ cyclotron: realistic beam losses ...

Licensing

- ▶ fundamental
- ▶ redundancy is good for reliability . . .
- ▶ but single point failures may cause problems !
- ▶ e.g. cyclotron with (up to) 3 injected beams ?

Conclusion

Present ADS projects that are trying to fly are proofs of feasibility — the only possible choice that may convince is

- ▶ based on established technology
- ▶ allowing for efficient prototyping
- ▶ that is scalable

and the answer to the initial question is 'Yes'.

For later industrial applications the answer may be different, but how to obtain the credibility ?