

Accelerator Physics

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Motivation

- Participation in the case study is required for the course certificate.
- The case study replaces the weekly exercise sheets.

Aim of the case study:

- Reflection and understanding of larger contexts
- Discussion of the lecture content with each other
- **Exercise of a realistic problem-solving case**

Procedure

- There is a worksheet with instructions and questions.
- You will work in groups of 3-4 participants in a self-organized way.
- Exchange on the status of the case study
 - in the lecture,
 - directly with the tutors, and
 - at the **interim discussion at 24.01.25.**
- **Presentation of the results at 14.02.25** (end of the semester)



Final presentation

- There is no “right” or “wrong” answer.
 - The question is rather: “Why did you make a certain decision?”
- ⇒ In addition to your design, you should also present how the project evolved and reflect on the decision making process.

TEILCHENSORTE

Welche Teilchen sollen beschleunigt werden?

Möglichkeiten:

Elektronen, Protonen, schwerere Ionen

Probleme:

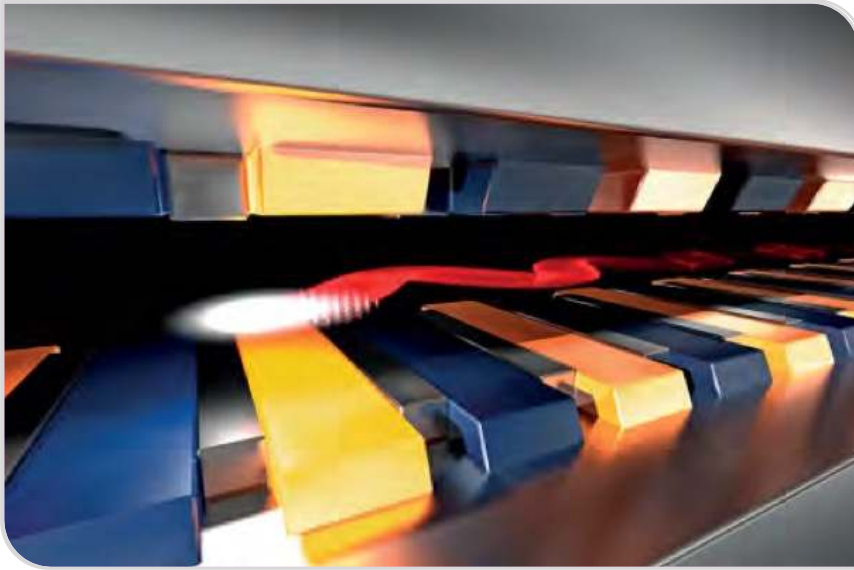
Elektronen strahlen zu viel Leistung (4 mW) ab. Werden verwendet für Präzisionsmessungen (da Elementarteilchen).
Schwerere Ionen zerbrechen unkontrolliert bei der Kollision. Durch die Kollision zwischen vielen Teilchen entsteht ein Quark-Gluon-Plasma (Urknall).

Lösung:

Protonen sind ein guter Kompromiss zwischen Masse und Ladung ($P_S = 6.4 \times 10^{-13}$ W). Es kollidieren die Quarks der Protonen.

Available topics

1) Free electron laser



2) Circular collider: top factory

