Collimation Upgrade Specification Meeting - ColUSM
March 27th, 2014
CERN, Geneva, CH

Introduction and strategy for hollow e-lens studies

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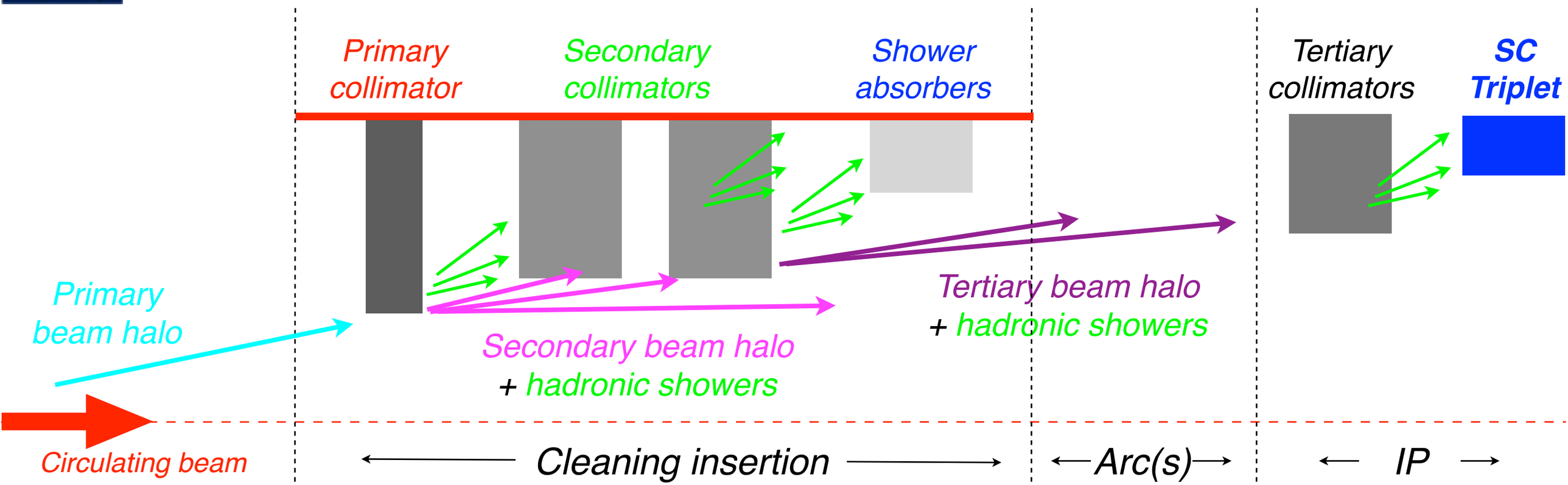
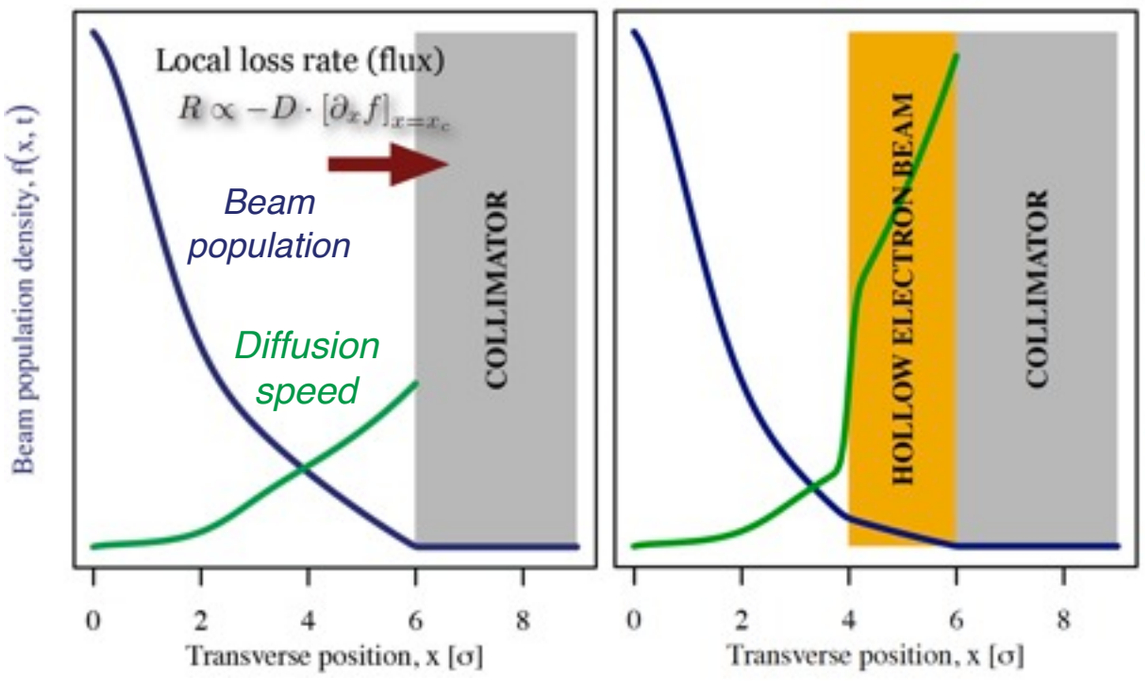
Outline

- ☑ Introduction
- ☑ Motivations
- ☑ Timeline
- ☑ CERN strategy
- ☑ Scope of this meeting

Introduction



Illustrative scheme



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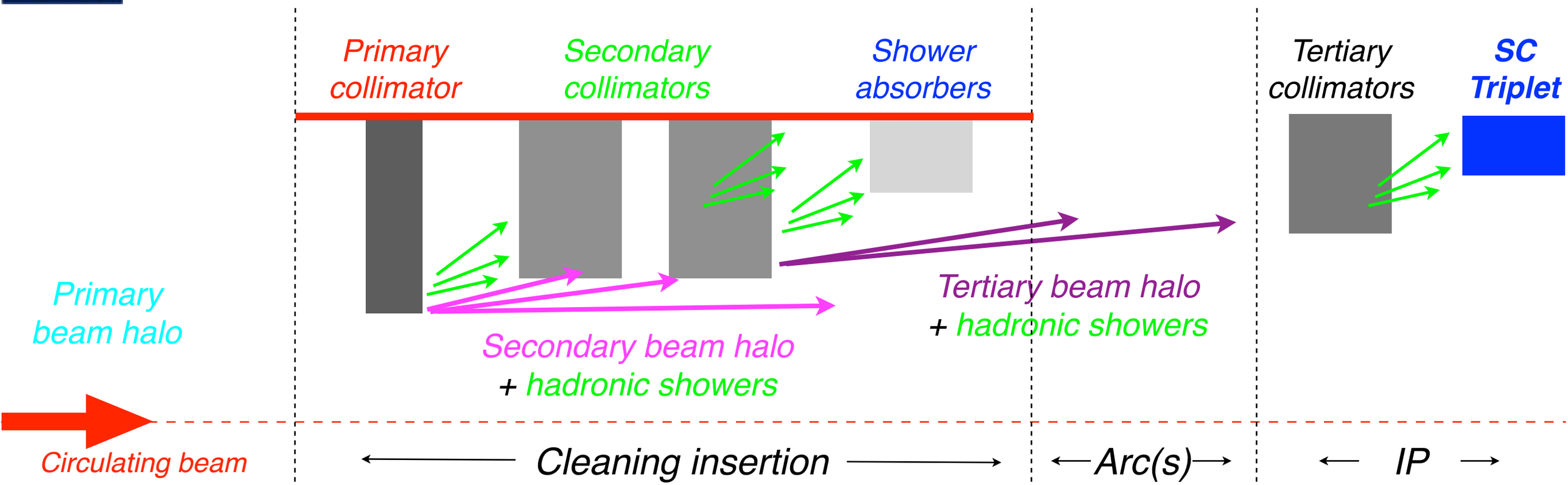

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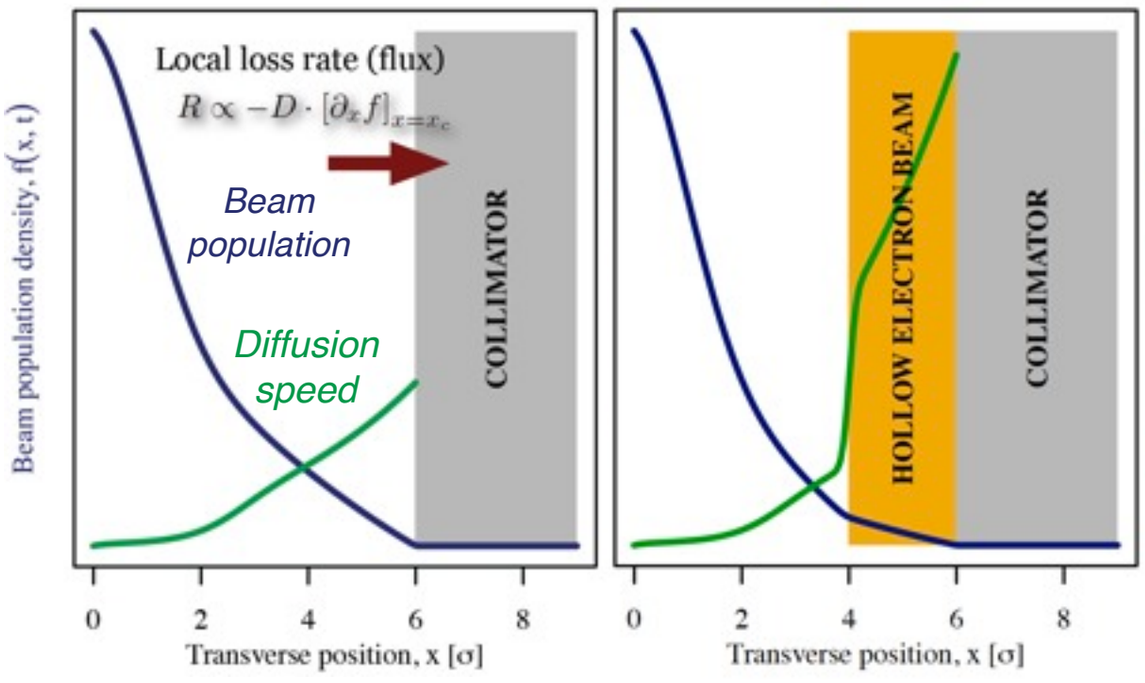

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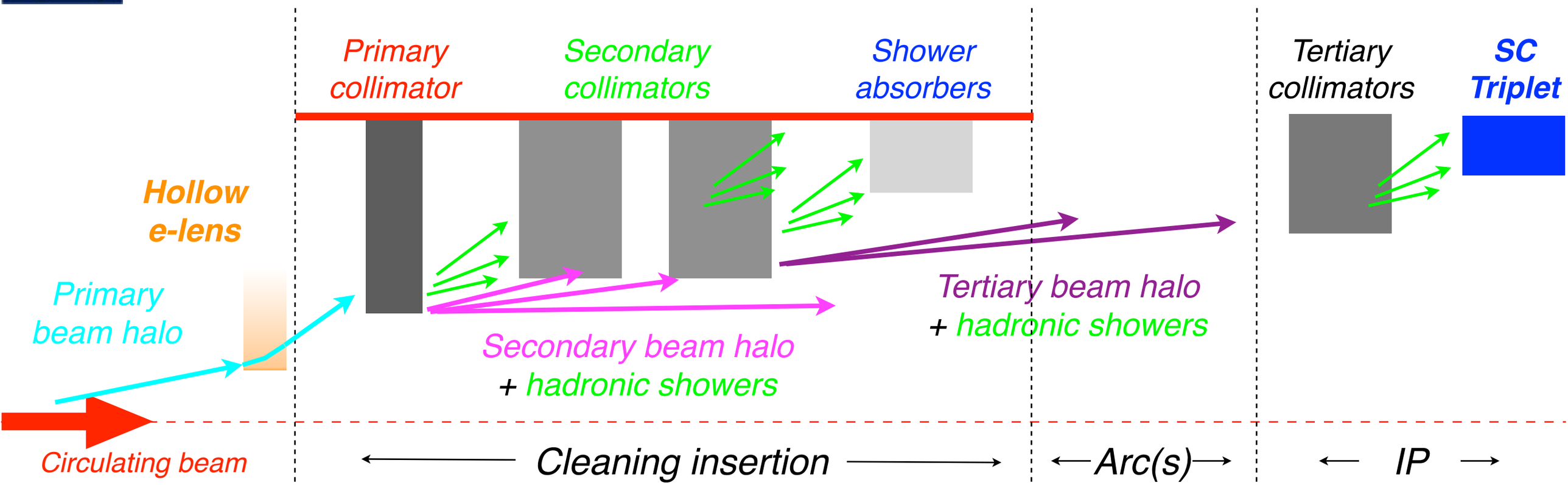

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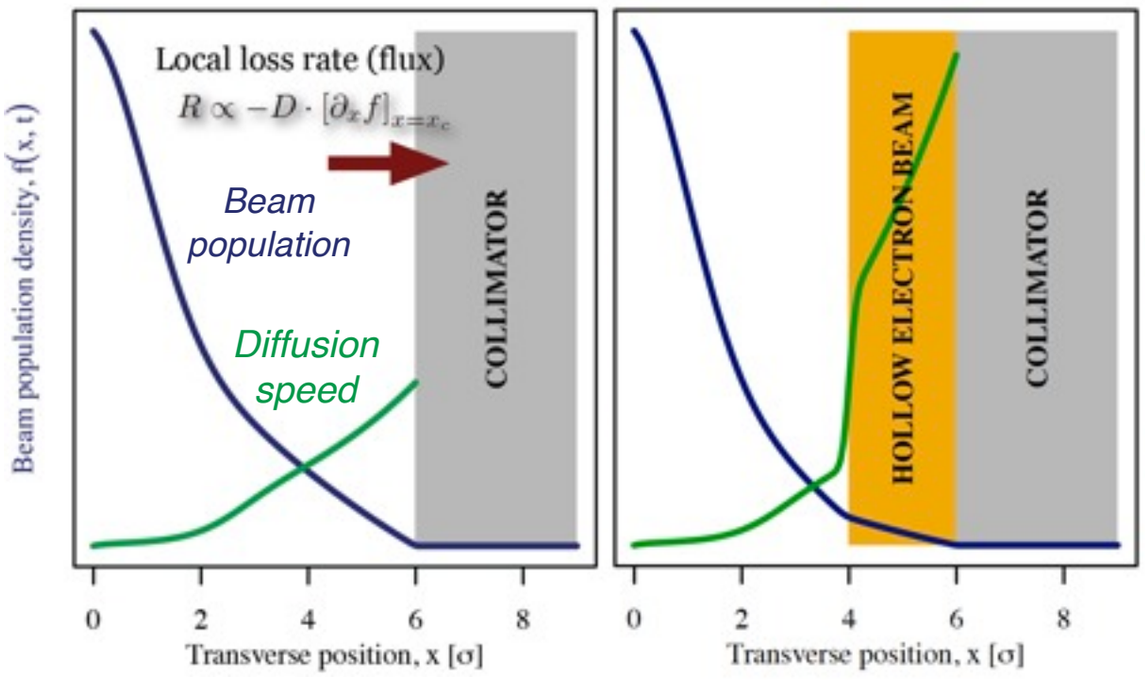

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- **Other potential usages**
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- **Important questions / caveats**
  - *Do we really need it? → Need to see during post LS1 performance*
  - *This technique must be addressed in comparison to other techniques that might be deployed on a shorter timescale if needed.*
  - *Can it work well for the LHC beams (more complex e-beam powering and tighter operational conditions than at the Tevatron)?*

(Recent) timeline

- **CERN review in Nov. 2012**

  Brought up technical aspects for installation in LHC or SPS.

- **HiLumi annual meeting in Frascati, end of Nov. 2012**

  Strong message about CERN interest to pursue this option in the future.

- **End of 2012**

  Hollow e-lens item into the US-LARP list of topics (item under observation)!

- **End of Jan. 2013**

  CERN internal executive meeting to propose a strategy base on the technical input of the the review.

- **March 2013**

  Presentation to HLTC and proposal of working plan.

- **April 2013**

  Present CERN strategy to US-LARP CM20 to steer USA contribution.

- **December 2013**

  First complete draft of CDR by FNAL team

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Scope of our studies:
- Have a solution for implementation in LS2 (if proved necessary)
- More optimized solutions for the HL-LHC (LS3 implementation)

CERN strategy as of US-LARP-CM20

CERN strategy

Taking into account the present financial situation and the manpower commitment to the LS1 activities, CERN cannot decide now on the installation of the available Tevatron hardware in the SPS or the LHC.

This also takes into account that firm indications of LHC critical performance limitations without scraping, can only become apparent after some operational experience at energies near to 7 TeV.

The CERN management fully supports the studies on hollow e-lens and strongly recommends to **focus the presently available resources** towards the **preparation** of a possible **production of 2 hollow e-lens for the LHC**.

- **Design** of a device optimized for the LHC at 7 TeV (improve integration into the LHC infrastructure and improve instrumentation).
- Actively **participate** to beam tests worldwide on this topic.
  Specifically, CERN endorses the setup of hollow e-beam tests in RHIC.
- Start building **competence at CERN** on the hollow e-beam hardware.
- Continue working on **alternative methods** for halo scraping.
- Work with very high priority on **improving the halo diagnostic** at the LHC.

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  - Identify a number of questions that can be addressed until the CM22
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- ☑ Reminder: In parallel, we are working on alternatives (ADT narrow-band excitation, tune modulation). Aim: act on LS1.
  We will also discuss simulations for these cases at the CM22!