

Why this SC-13 Workshop?

General CERN Interest

1. The **LIU goal**: “Double the number of particles per bunch”
→ **Space Charge** has become very relevant for LHC injectors
2. **Generational Problem** for the Injectors → We have started to create a **new team of expertise on space charge** covering all 3 rings
3. **Strengthen Collaboration with other Laboratories** (resurrected or new):
 - a) **GSI**
 - b) **Fermilab/SNS**
 - c) **Others?**
4. We are at a **crossroad** for our **LIU studies**:
 - a) **Huge effort** made to do **experiments** until this spring
 - b) → **This workshop** ←
 - c) **Simulations** to **understand** and **improve** our machines to reach **LIU goal**

Why this SC-13 Workshop?

CERN Technical View

- We need a sufficiently good non-linear magnet-by-magnet model for the 3 machines → How to achieve that?
- Which Computational Tools are needed?
 - Considerable Investment into PTC-ORBIT
 - Can we cross bench-marking with an alternative Code?
 - Besides PIC codes we also need frozen space charge codes (again more than one) → When to use PIC and when “frozen”?
 - We need to gain ownership of the codes and fully understand them
- What can at best be expected from the benchmarking of the codes with experiments?

GOALS for the workshop

- Find **answers** to the **set of questions** we have **prepared** and **new relevant questions** from the community
- Therefore:
 - Each days ends with a **special sessions** to **trigger** a **discussion** of the **sessions** of that day
 - The workshop will end with a **long joint discussion session** to determine “**best**” answers to our questions
 - The **scientific secretaries** will make an effort to **record** all questions with the **responses** from the community

Motto of the Workshop:

Where do we stand where do we want to go!