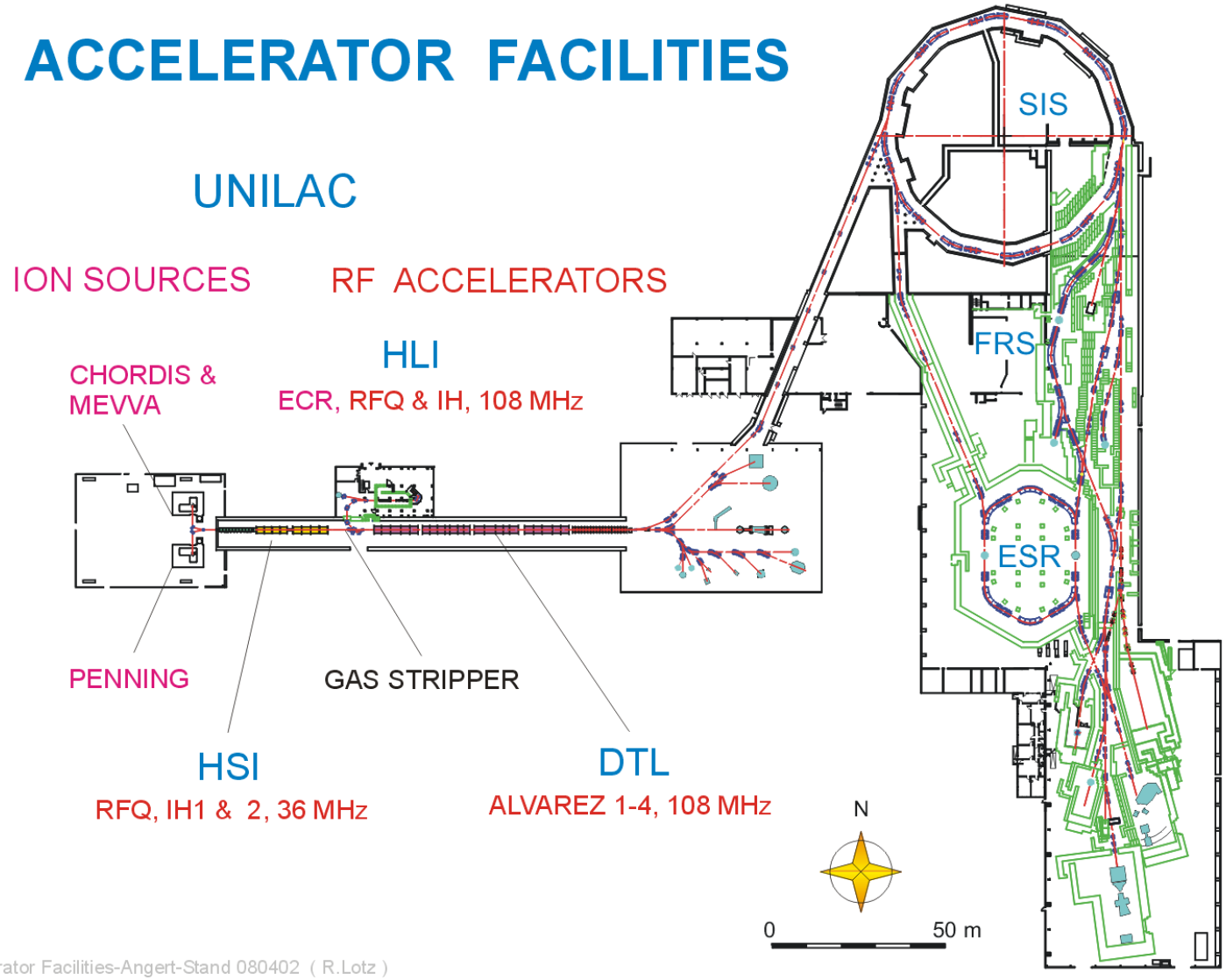
Accelerator Performance and New Developments

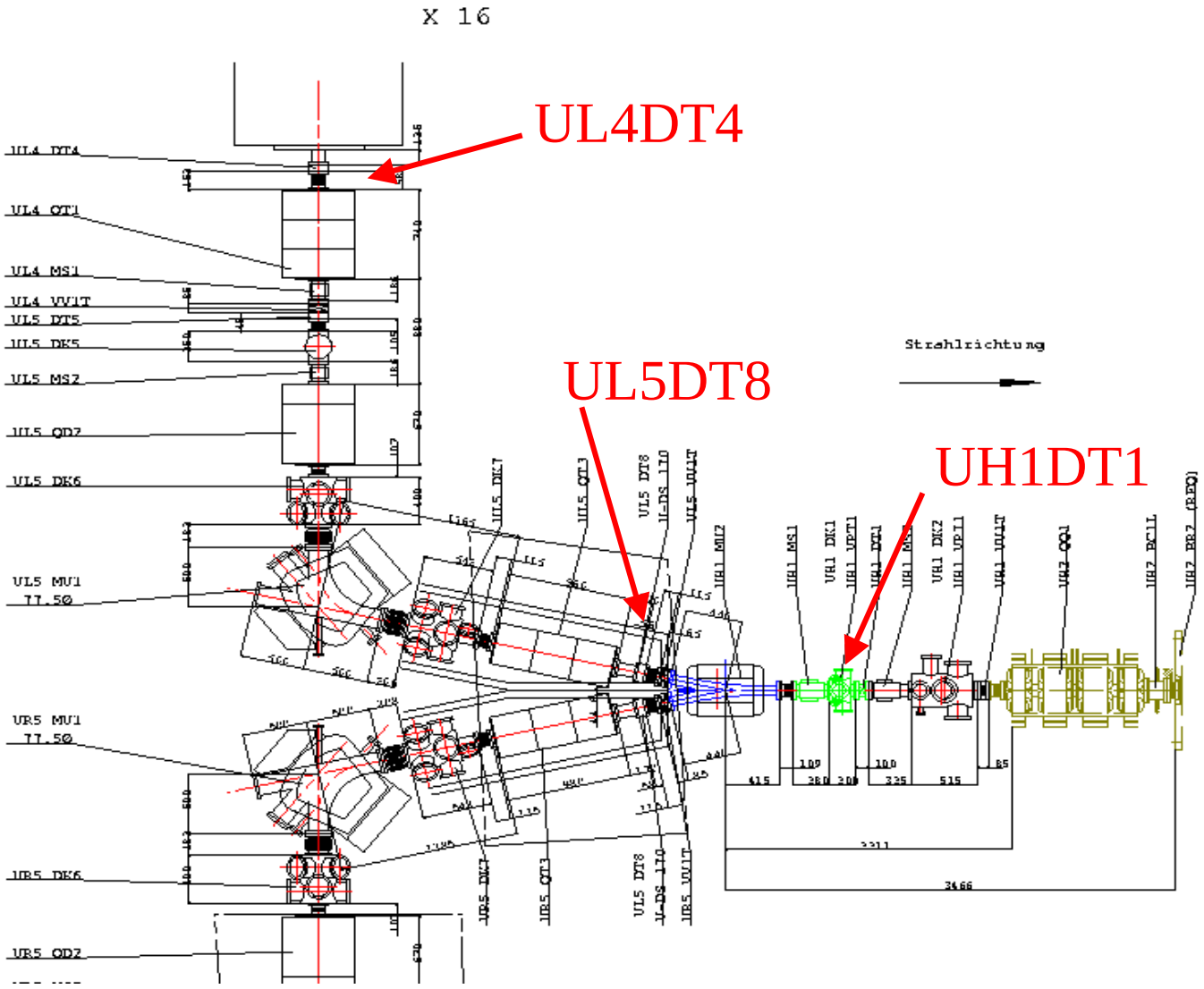
N. Angert,
GSI

- Ion Sources
- Unilac
- SIS18

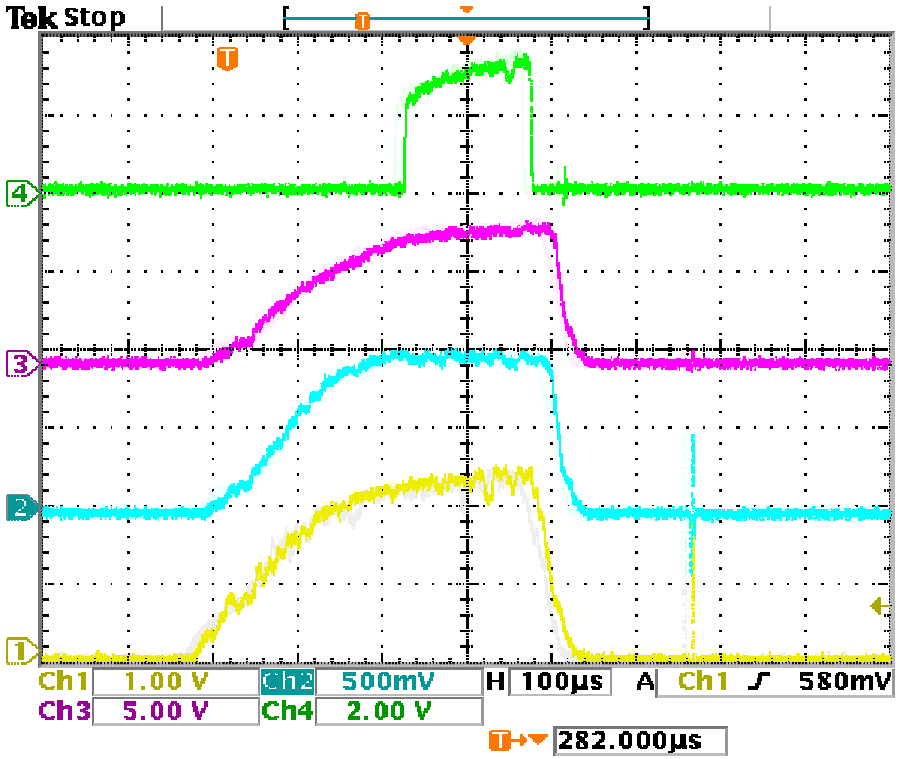
ACCELERATOR FACILITIES



LEBT-Section



LEBT/RFQ Transmission

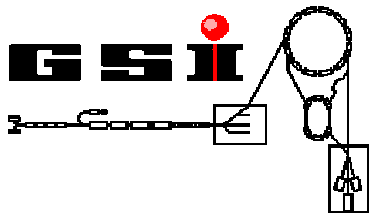


UH3DT2: 2 mA/div (~3 mA)

UH1DT1: 5 mA/div (~8 mA)

UL5DT8: 5 mA/div (~10 mA)

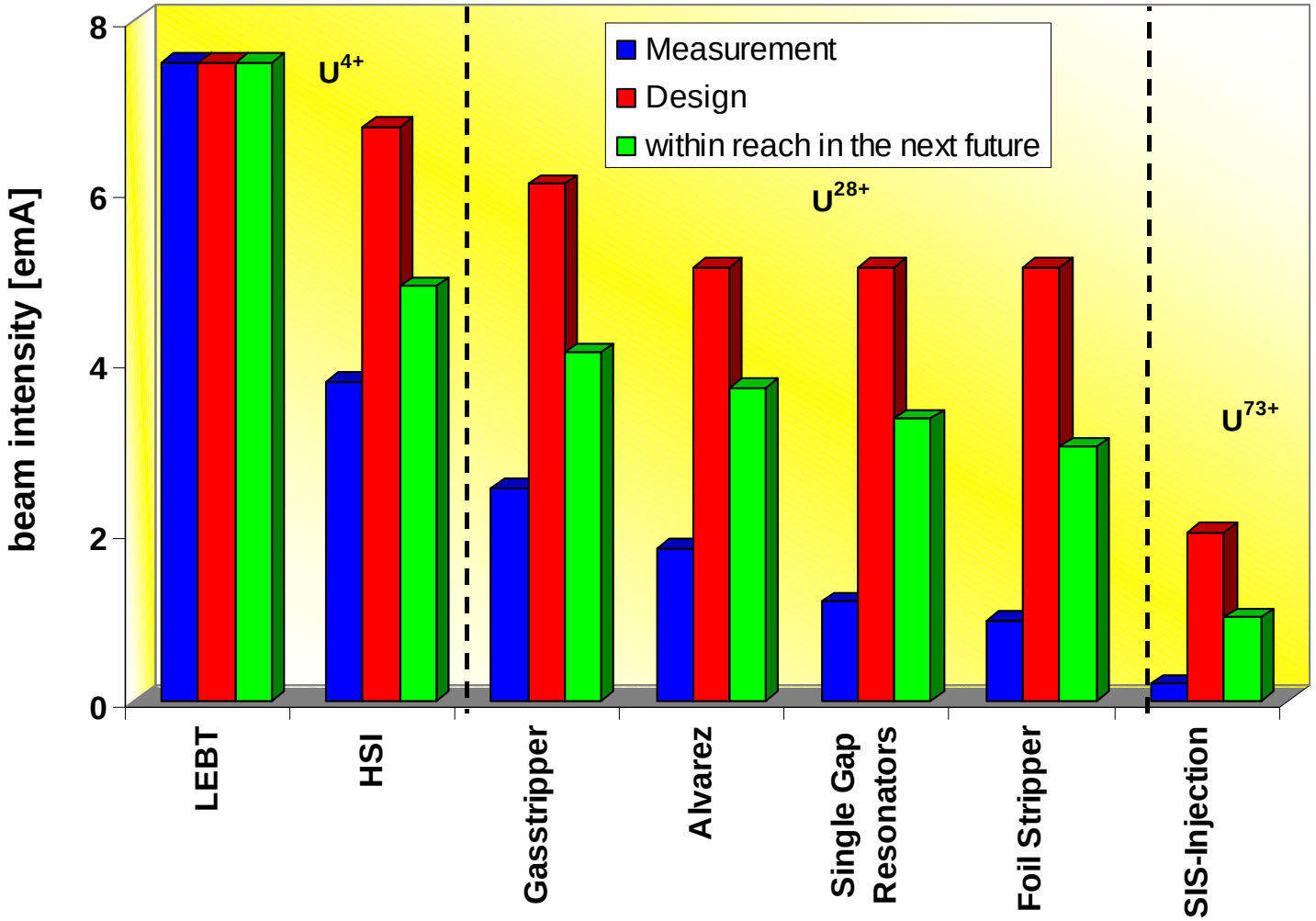
UL4DT4: 10 mA/div (~24 mA)



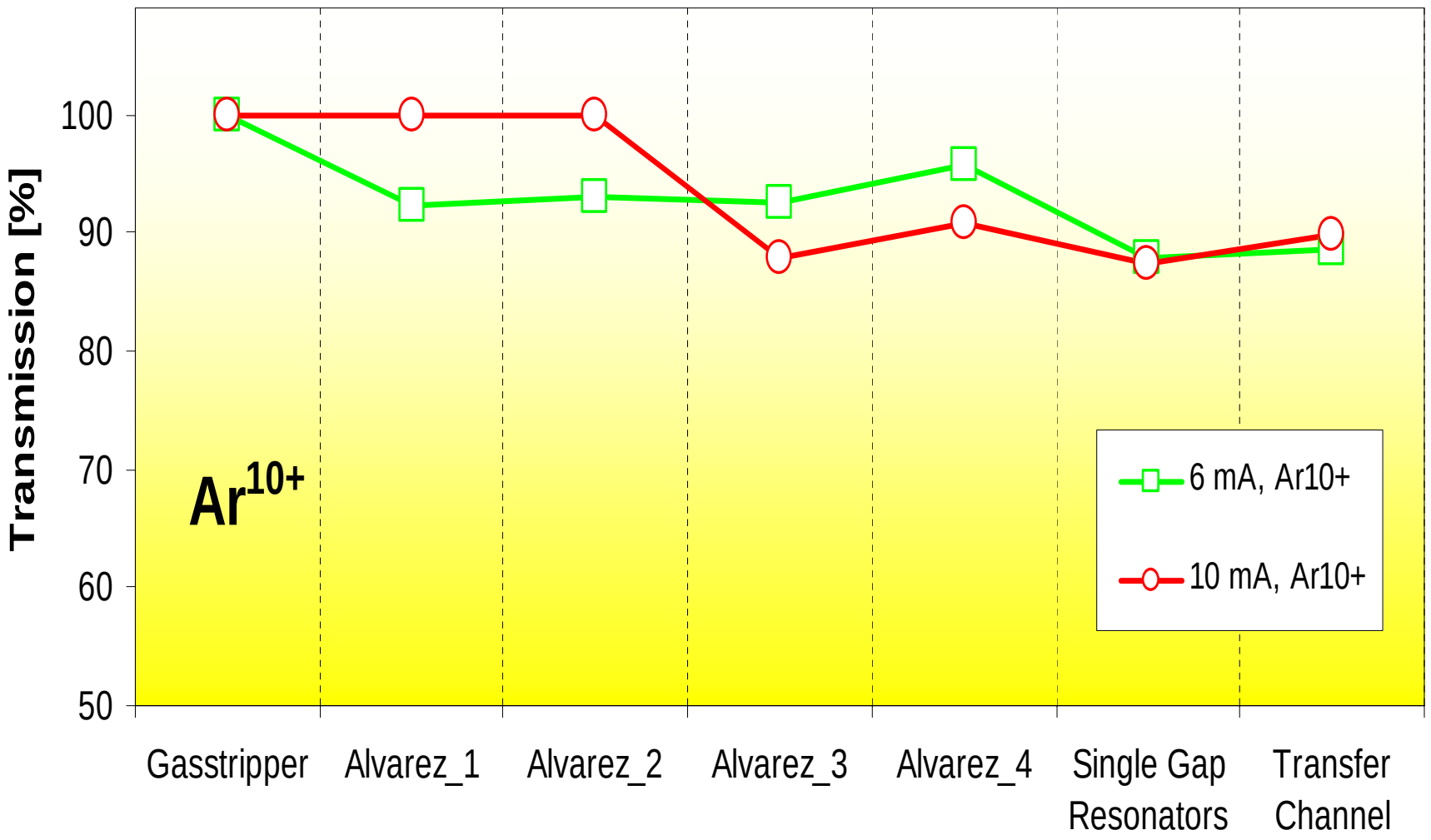
Modifications of the Ion Source

- using more stable grids within the ion source
  $\Rightarrow$ life time and pulse stability
- increase of the arc current from 300 A to 800 A
  $\Rightarrow$ pulse stability and noise reduction
- optimization of the extraction system (material, geometry)
  $\Rightarrow$ extractable current and availability
- glueing of the cathodes (carbonized glue)
  $\Rightarrow$ pulse stability
- use of one titanium cathode to start with better vacuum
  $\Rightarrow$ reliability, reaching faster good performance

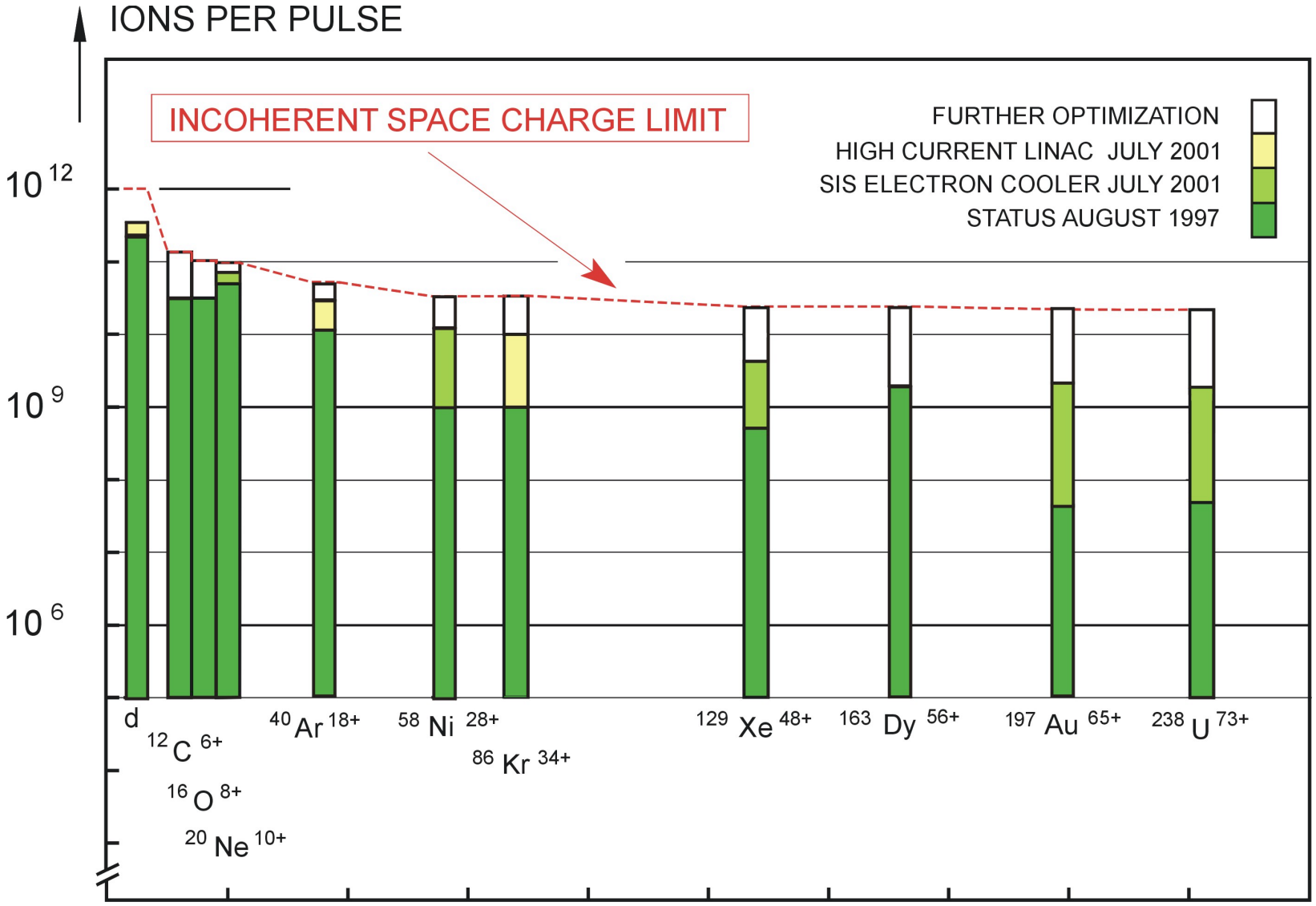
U^{4+}-beam operation in the GSI-Unilac (December 2001)



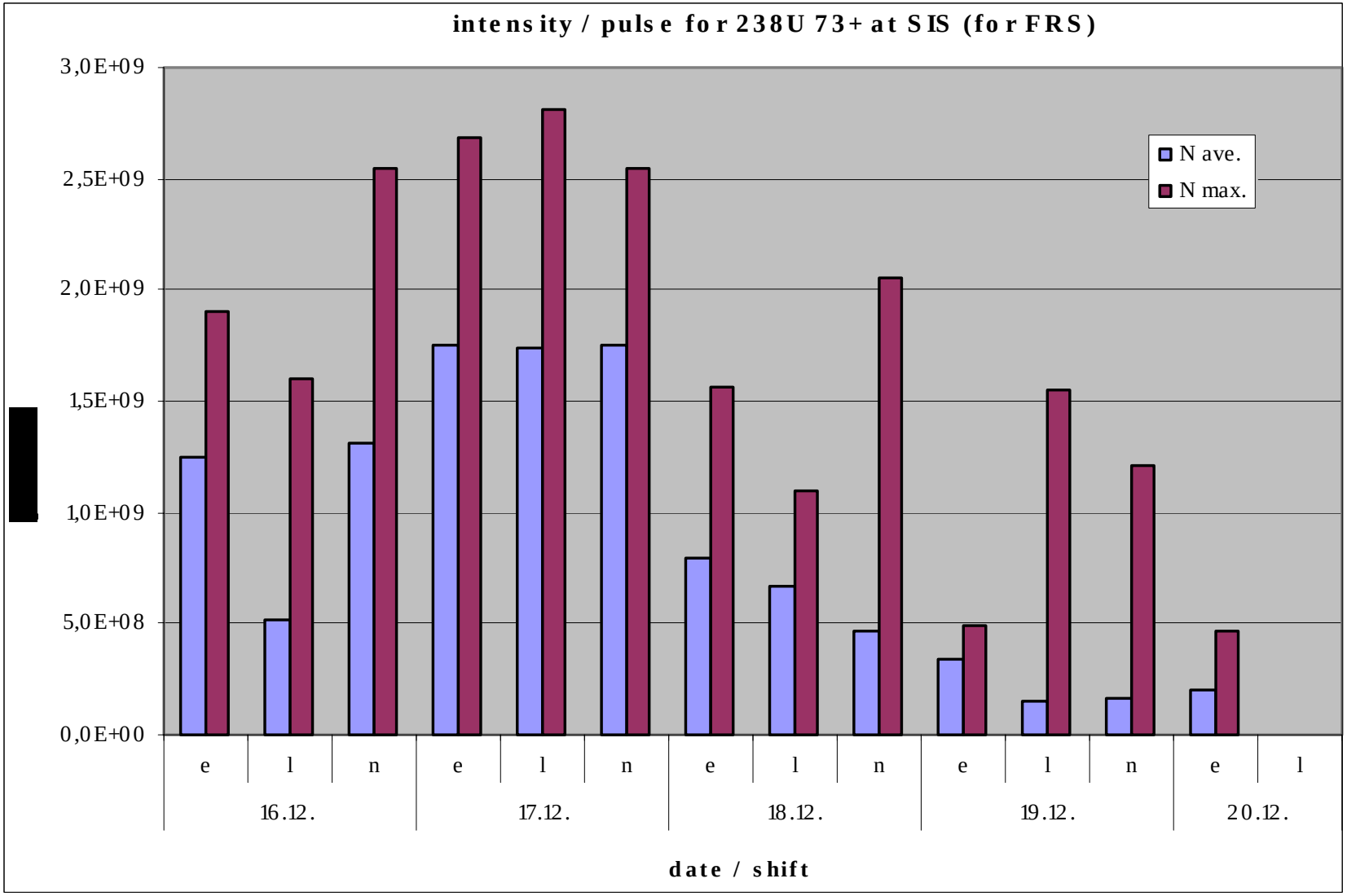
Particle transmission Poststripper-Transfer line



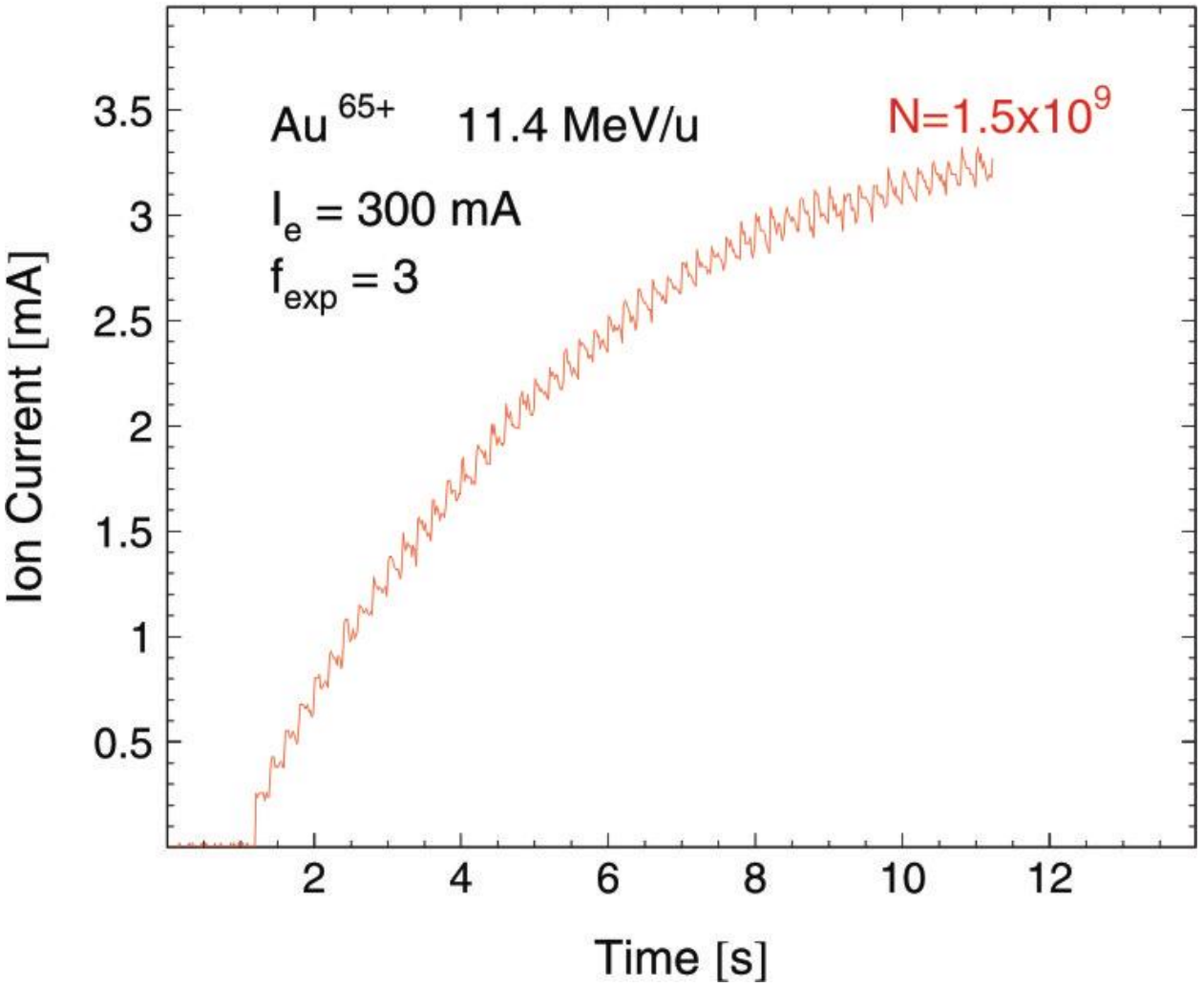
SIS Intensities



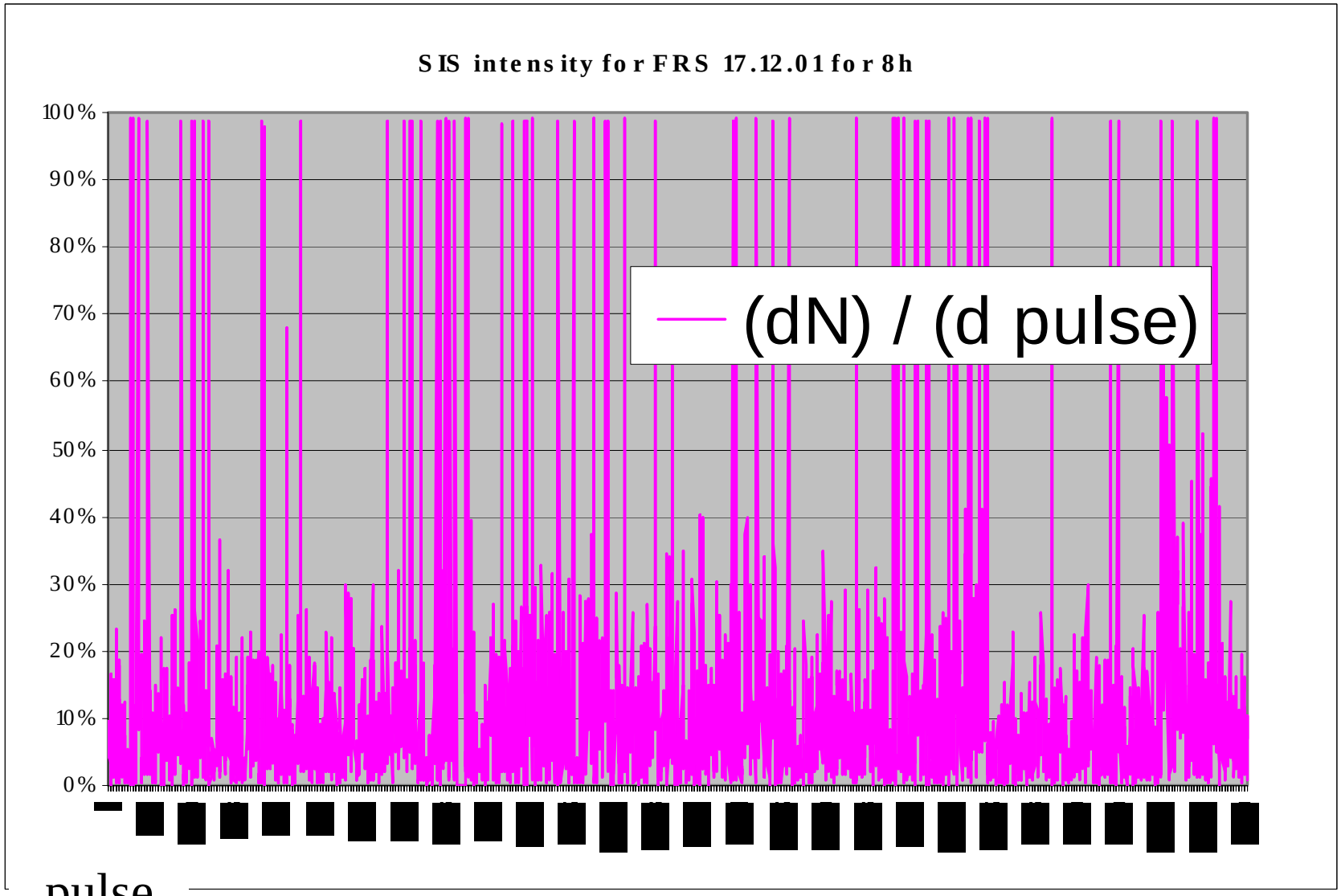
SIS Intensities



Maximum Intensity with Gold Ions



SIS Intensities



Development of SIS18

- 1.3 T/s $\rightarrow$ 4 T/s aim (1 Hz)
  June 2001 test with 25 MW pulse load/industrial customers; still interferences
  Solution: separate GSI 110 kV connection to 380 kV
  possible rearrangement in connection with airport extension could provide free 110 kV line

- new slow extraction mode with rf-noise voltage provides excellent position stability during spill

Summary

- Big step in MEVVA ion source performance towards routine operation
- But noise reduction still needed
- Bottle necks
  1. preacceleration
  2. matching to RFQ
  3. matching to Alvarez section
- 10^{10} particles/spill aim for 2002
- Machine development time needed to achieve argon beam transmission with uranium beam