# Maiden run of the Ion Guide - Laser Ion Source (IG-LIS) (Formerly RFQ-LIS)

## Ion source for isobaric clean beams

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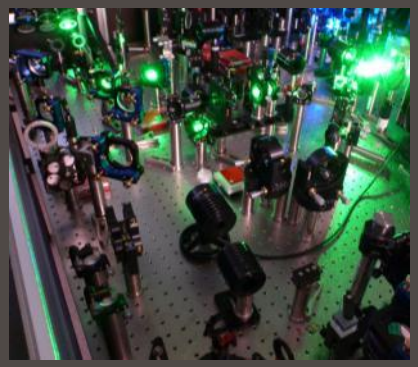
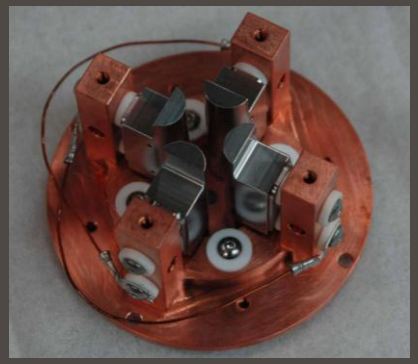
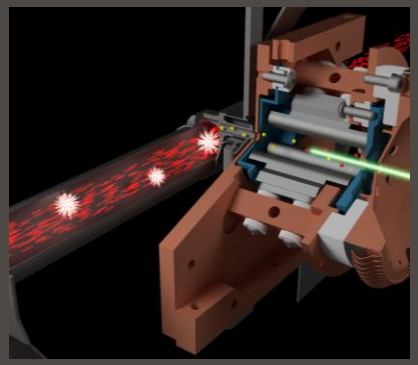
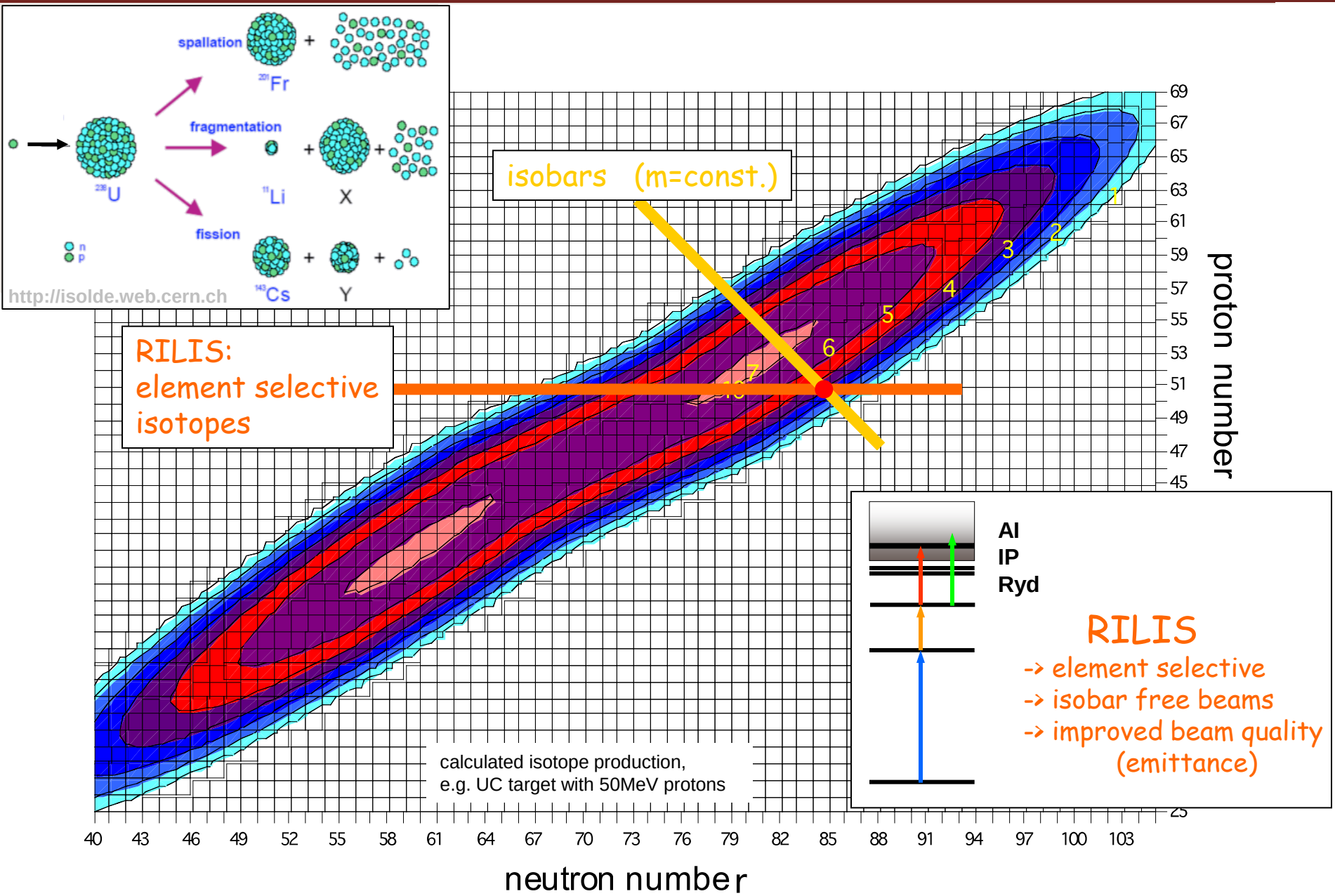
ISAC Science Forum May 8, 2013







# Motivation


spallation
$^{201}$Fr
fragmentation
$^{238}$U
$^{11}$Li
X
fission
$^{143}$Cs
Y
n
p
http://isolde.web.cern.ch
isobars (m=const.)
RILIS:
element selective
isotopes
1
2
3
4
5
6
7
proton number
neutron number
69
67
65
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82
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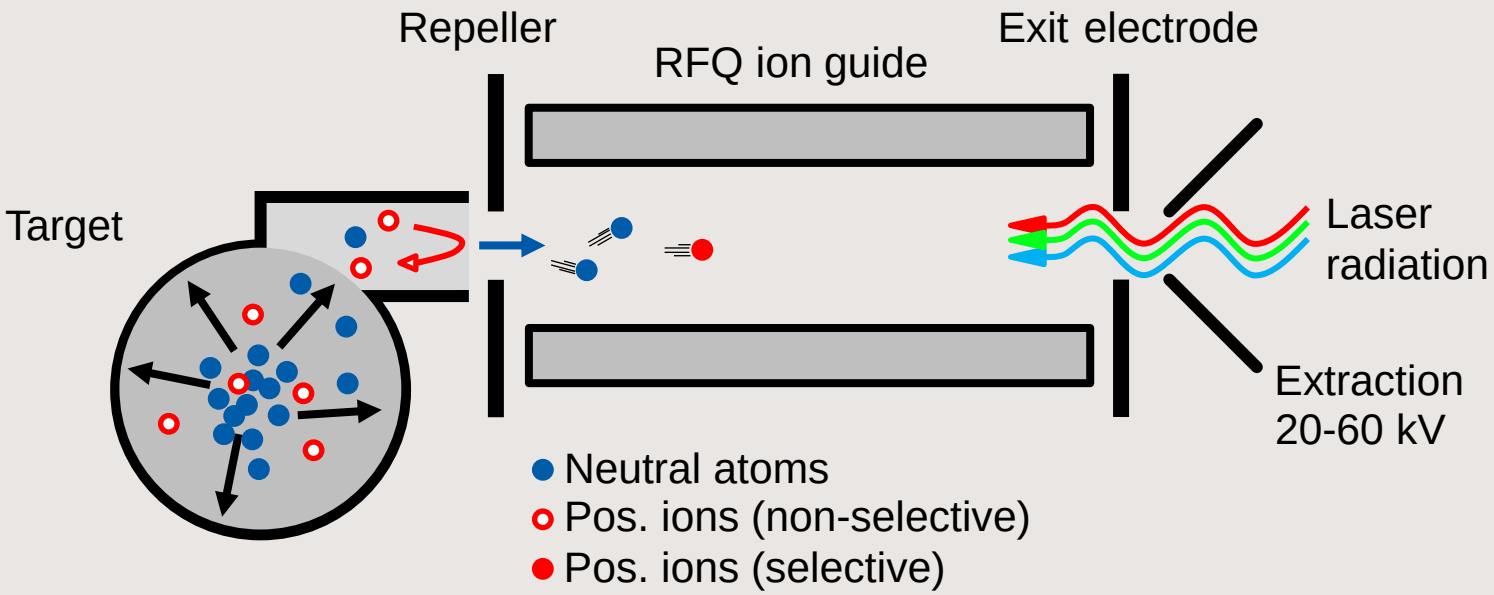
88
91
94
97
100
103
calculated isotope production,
e.g. UC target with 50MeV protons
Al
IP
Ryd
RILIS
-> element selective
-> isobar free beams
-> improved beam quality
(emittance)

# Concept IG-LIS

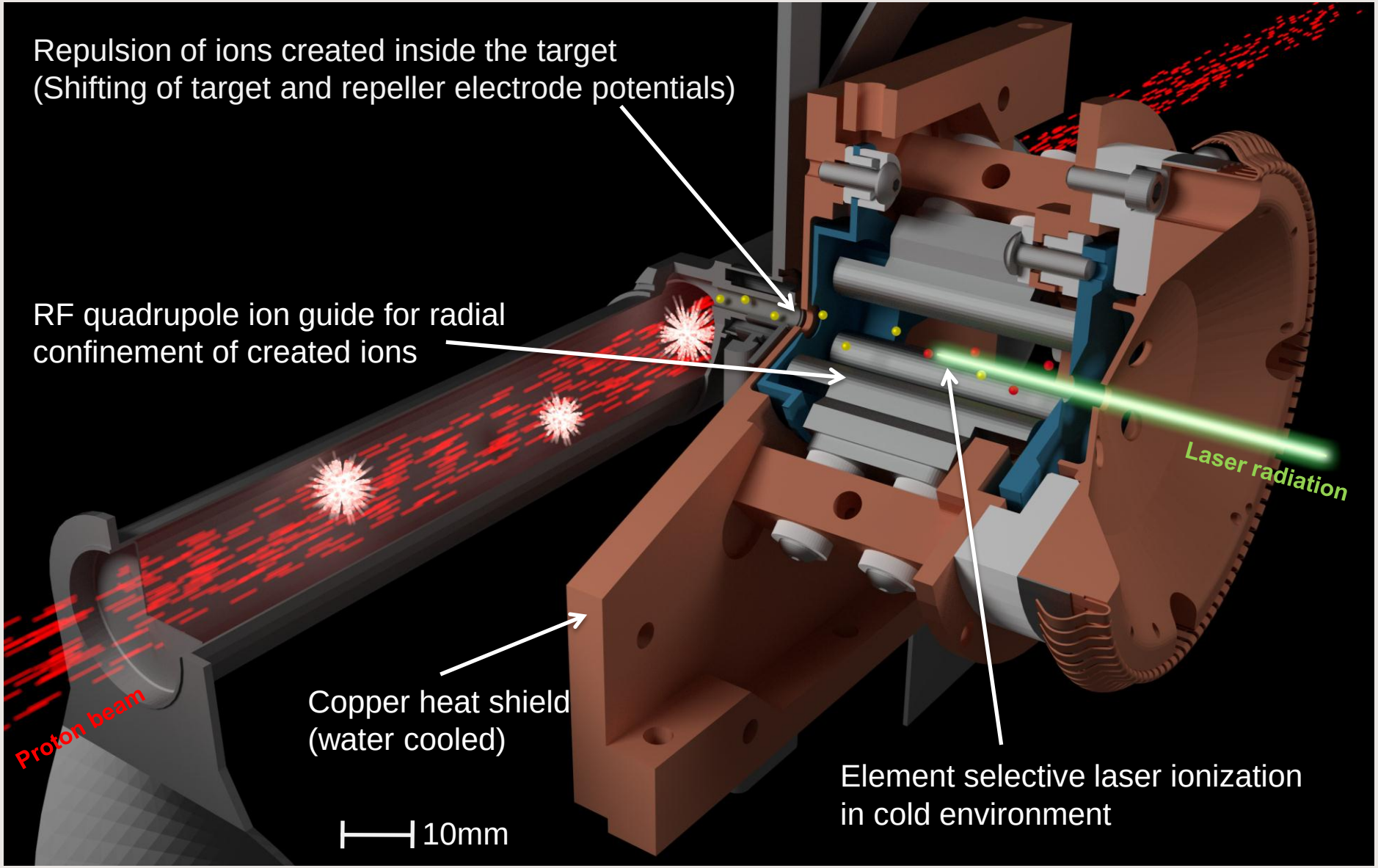
- Decoupling of evaporation processes and laser ionization
  - Suppression of surface ions from target
  - Laser ionization in “cold” environment



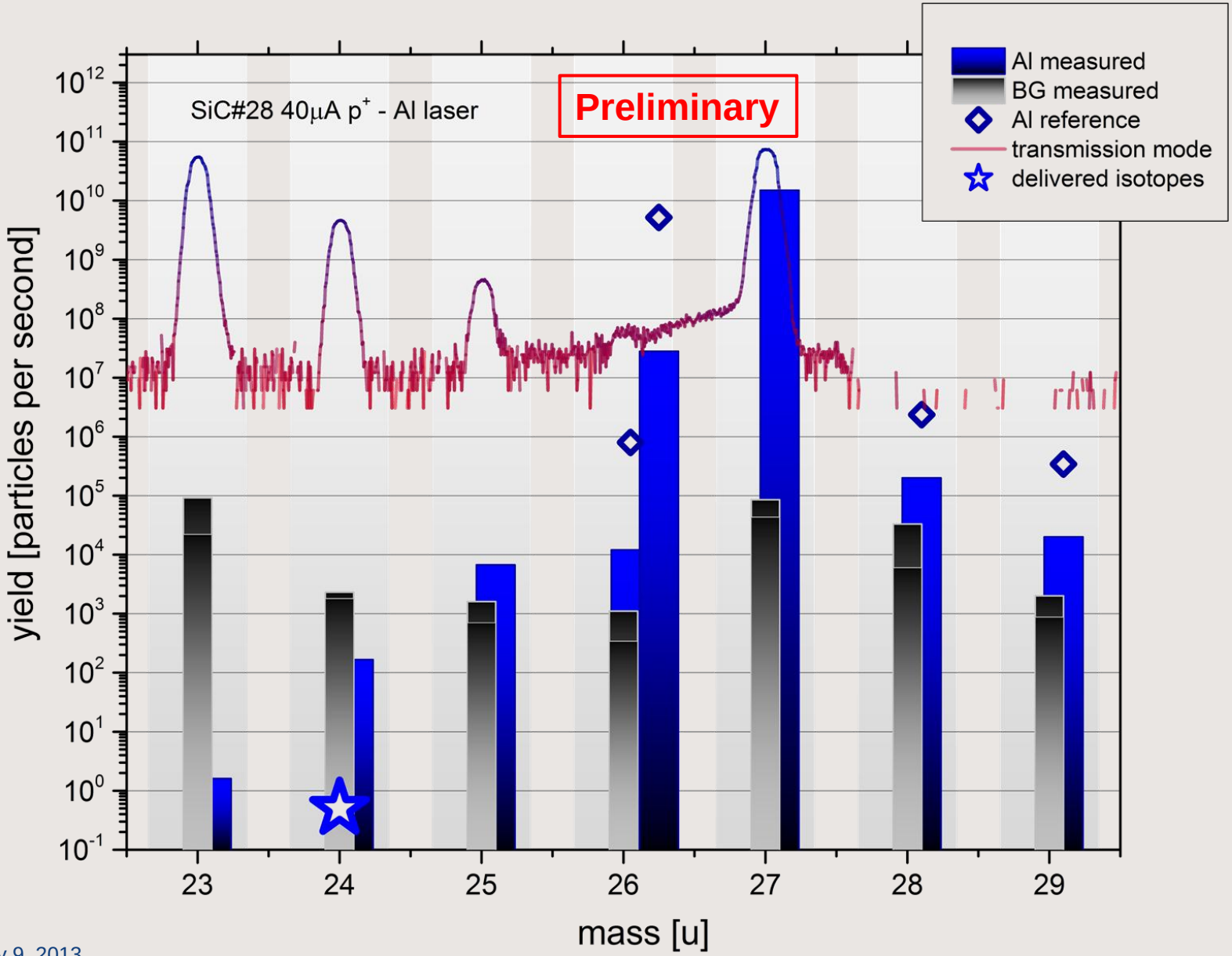

- Drawback: Decrease of ionization efficiency
  - Shorter interaction time of atoms and lasers
  - Limitation of accepted ionization volume

**Proposed by:**
**K. Blaum, C. Geppert and H.-J. Kluge et al.,**
***Nucl. Instr. Meth. Phys. Res.* B, 204, 2003**

# Technical realization: IG-LIS @ ISAC

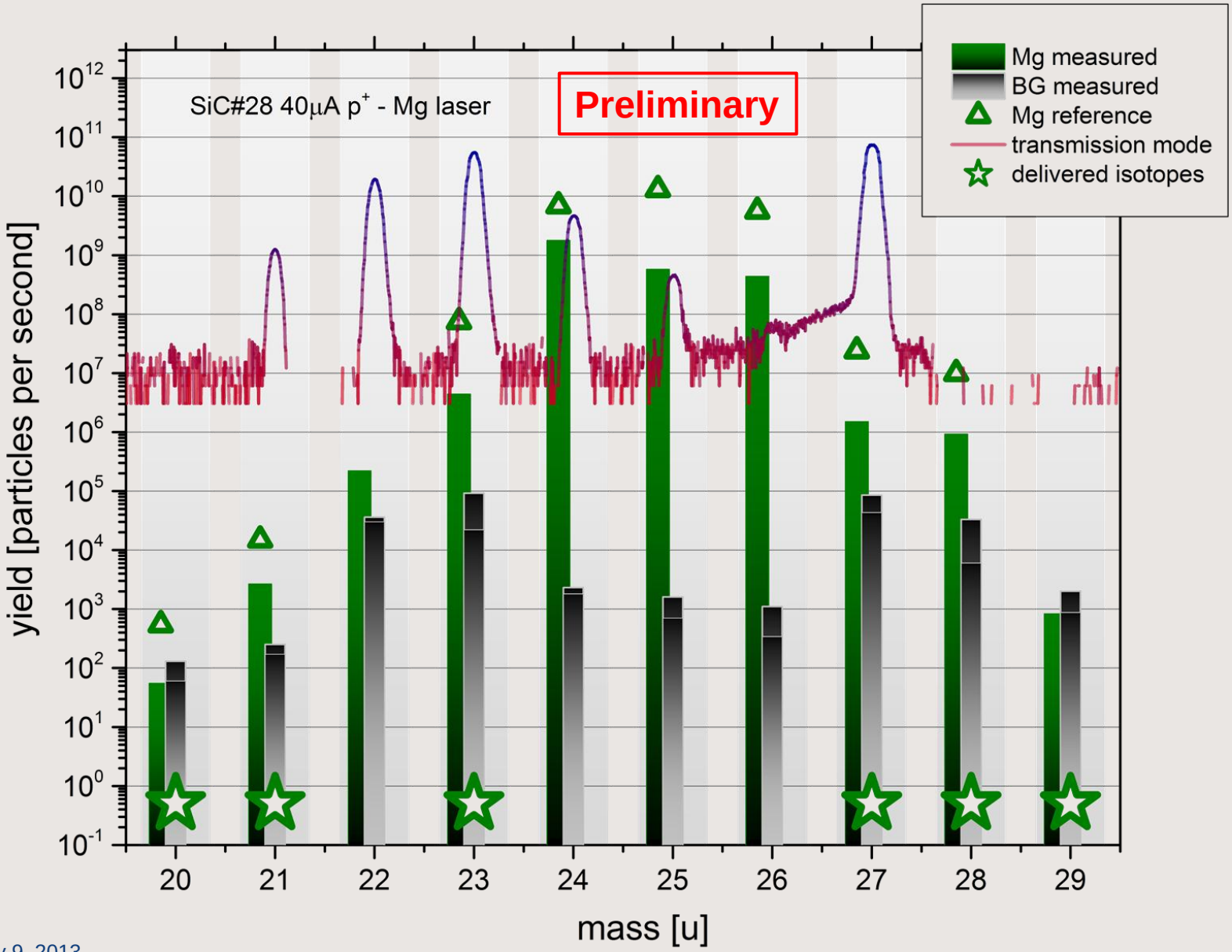


# IG-LIS Al yield overview SiC 40µA




Reference: Yield DB SiC#19-LP-SIS

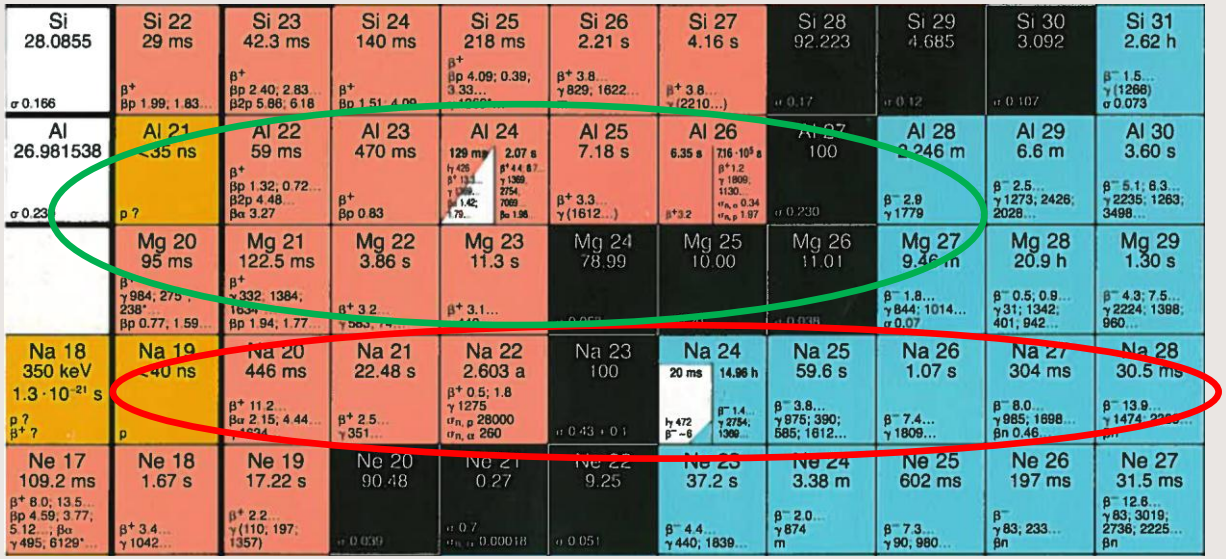
# IG-LIS Mg yield overview SiC 40µA




Reference: Yield DB SiC#19-LP-SIS

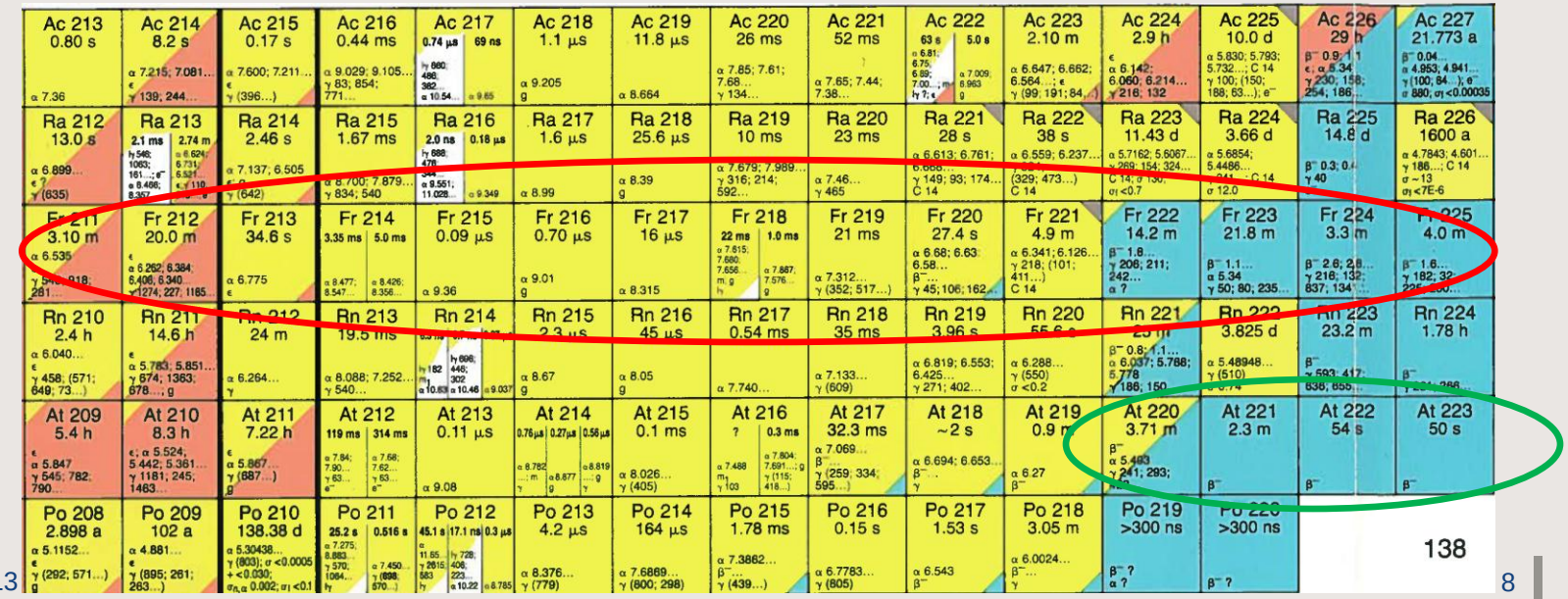
# Summary

- **Problem-free** maiden run of new ion source
- **Isobar suppression** of up to **$10^6$** demonstrated (Na)
- **Yield reduction seen** typically **< 50**
- **7 RIBs** successfully **delivered** to experiment
  - Some of which were not accessible before (Na contamination)



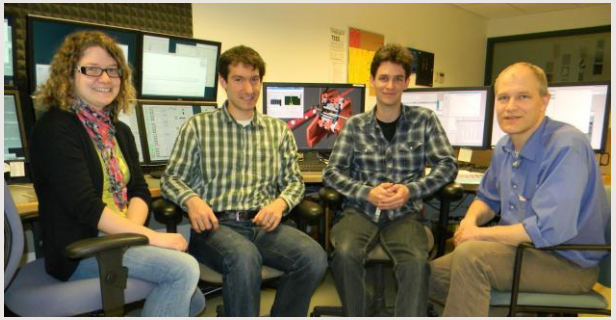
# Outlook

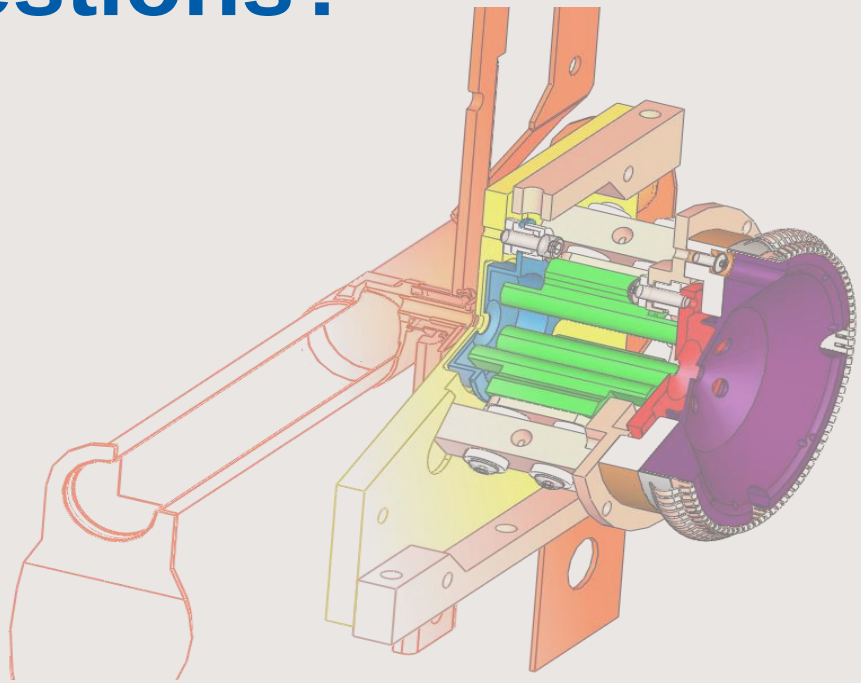
- **Next run** planned for **Dec 2013**
  - Heavier isotopes from **UCx** Target
- **Several requested beams** require isobaric purification
  - Suppression of surface ionized Cs and Fr
  - Beam requests: TITAN, 8Pi



# Thank You!

# Questions?





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