

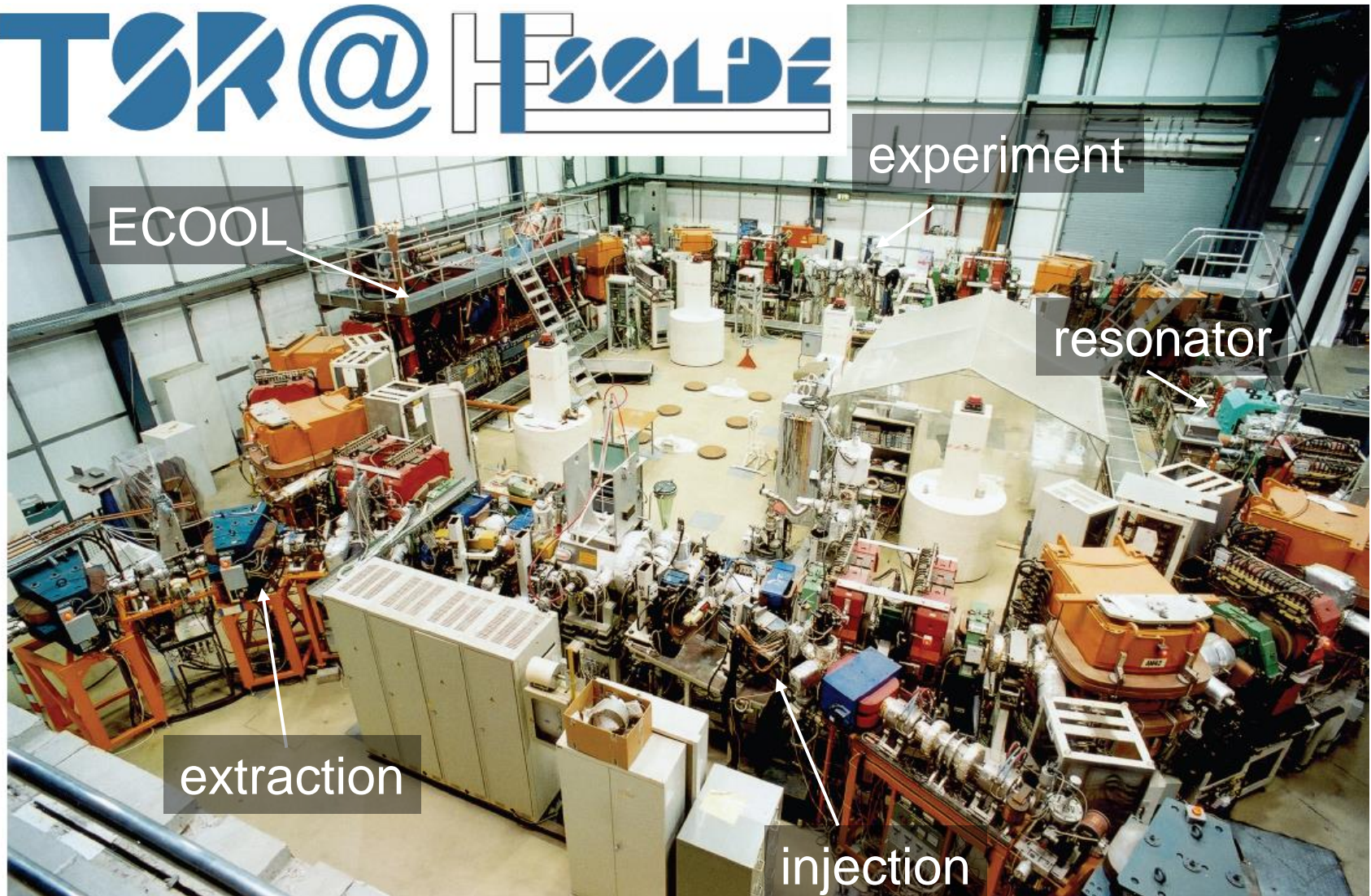


Status of the TSR@ISOLDE Project

Klaus Blaum, MPI for Nuclear Physics, Heidelberg
for the TSR@ISOLDE Collaboration

CERN, Geneva, February 14th 2014

TOR@FH Solde



Advantages

With respect to in-flight storage rings

- High intensity
- Cooler beams
- Much faster

With respect to “direct” beams

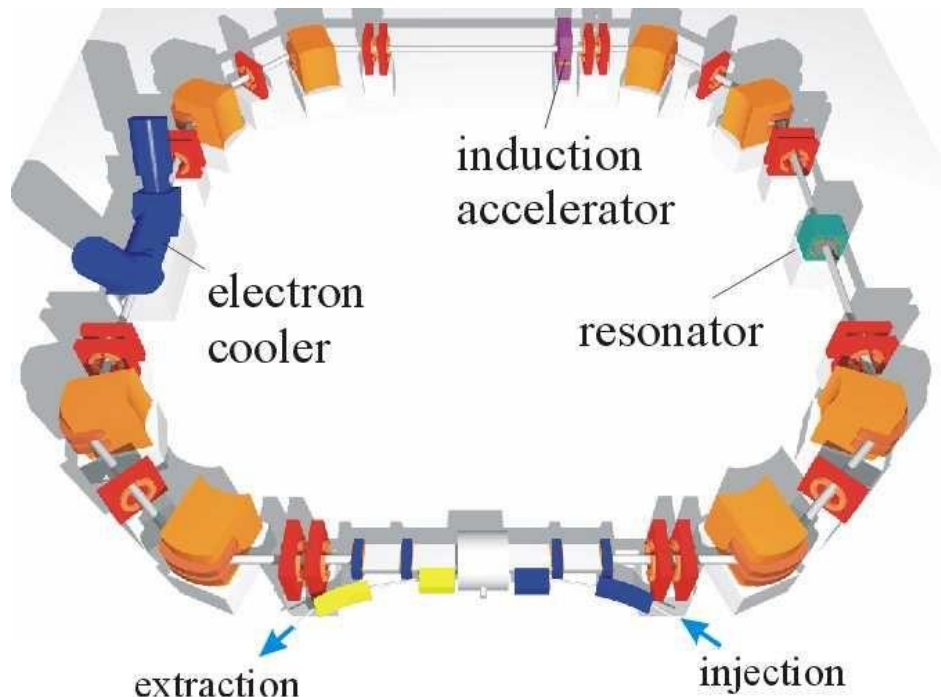
- Less background (target, beam dump)
- Improved resolution
- CW beam

Physics programme

- Astrophysics **Woods**
Capture, transfer reactions
 ^7Be half life **Litvinov**
- Atomic physics **Wolf**
Effects on half lives **Brandau**
Di- electronic recombination **Lestinsky**
- Nuclear physics **Raabe**
Nuclear reactions **Freeman**
Isomeric states **Walker**
Halo states **Borge**
Laser spectroscopy **Flanagan**
- Neutrino physics **Zuber**
Volpe

→ A world-unique installation!

Submission of TDR to the INTC in Jan'12



02.02.2012: „The INTC strongly endorsed the TSR-TDR“

Eur. Phys. J. Special Topics
207, 1-117 (2012)

K. Blaum, Y. Blumenfeld, P.A. Butler, M. Grieser, Yu.A. Litvinov,
R. Raabe, F. Wenander and Ph.J. Woods (Eds.)

Storage Ring Facility at HIE-ISOLDE

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THE EUROPEAN
PHYSICAL JOURNAL
SPECIAL TOPICS

Review

Storage ring at HIE-ISOLDE

Technical design report

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TSR@ISOLDE Collaboration: 129 scientists from 47 institutions in 19 countries



A photograph of the ion storage ring TSR at the Max-Planck Institute for Nuclear Physics in Heidelberg. It is proposed to install this ring at the HIE-ISOLDE facility in CERN, thus enabling a variety of unique experiments in nuclear-, astro- and atomic physics.

edp sciences  Springer

C. Scheidenberger^{22,3,a}, S. Schippers¹³, D. Schneider⁴³, R. Schuch⁴⁴, D. Schwalm^{1,45},
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D. Voulot⁵, P.M. Walker^{5,20}, E. Wildner⁵, N. Winckler¹, D.F.A. Winters^{3,a},
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^aThe members of the GSI Helmholtzzentrum für Schwerionenforschung will exploit the synergies with the FAIR physics program and concentrate on R&D activities relevant for FAIR.

● Conveners

Reaction Experiments

Atomic Physics Experiments

Astrophysics Experiments

Neutrino Experiments

Atomic Effects on Nuclear Lifetimes

Isomeric Beam Experiments

Dielectronic Recombination on Exotic Nuclei

Laser Spectroscopy

Peter Egelhof & Dennis Mucher

Daniel Savin & Stefan Schippers

Shawn Bishop & Rene Reifarth

Thierry Stora & Cristina Volpe

Fritz Bosch & Takayuki Yamaguchi

George Dracoulis & Phil Walker

Carsten Brandau & Andreas Wolf

Kieran Flanagan & tba.

A major milestone

30.05.2012 Approval of TSR by CERN Research Board

CERN's Research Board gave skeleton* approval for allocating resources to the TSR project (building and transfer line(s)).

*The adjective "skeleton" means that the end date is fuzzy, and no definite resources appropriation is made yet.

**Thanks to Sergio Bertolucci, Paul Collier and Steve Myers
for their encouraging support!**

Mandate of the TSR Integration Study Working Group (Paul Collier)

Membership

The members of the working group are E. Piselli, E. Siesling and F. Wenander. They will involve CERN specialists as and when necessary.

Reporting

The working group will report to the Director of the Accelerator and Technology Sector and for technical matters on progress to the IEFC

Milestones

A report summarizing the integration study will be submitted to the Director of the Accelerator and Technology Sector by Q3 2013.

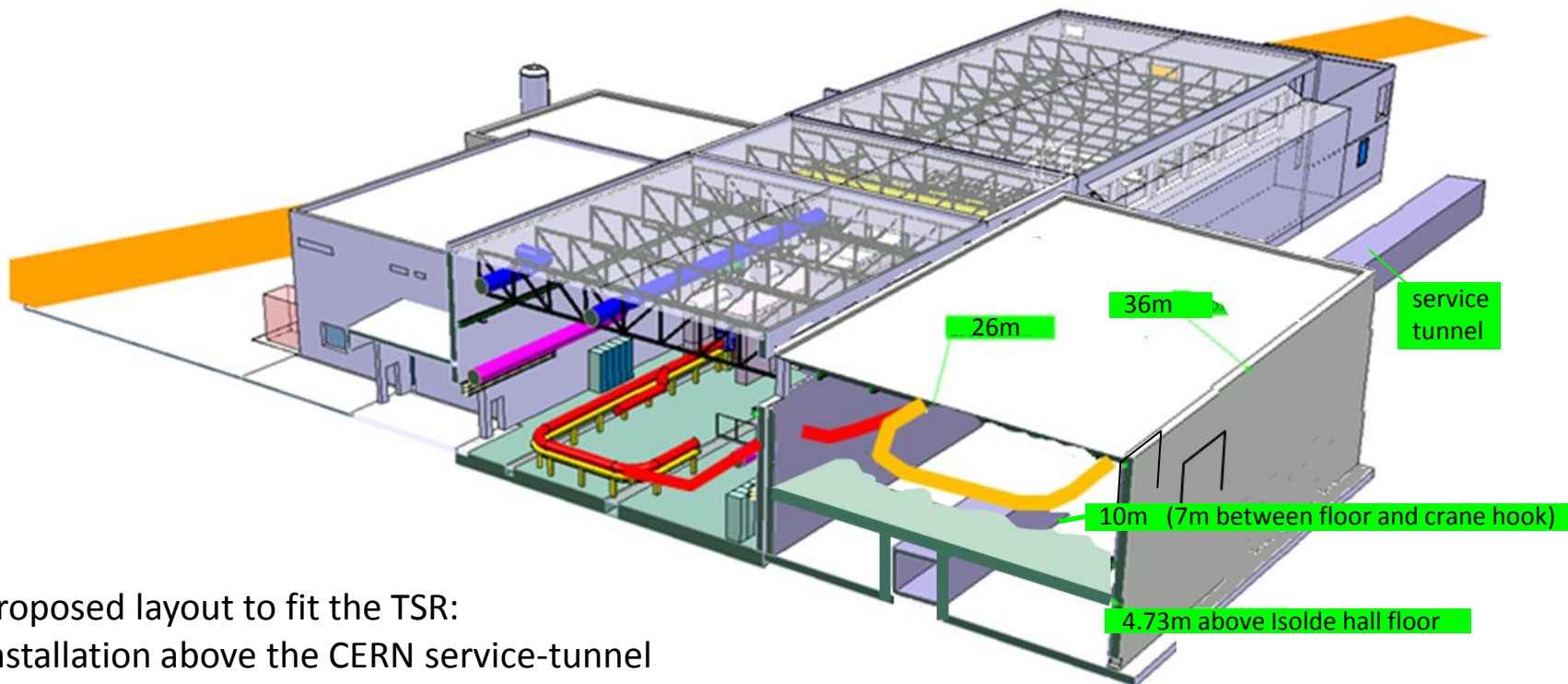
Coupling to HIE-ISOLDE

- Possible TSR installation above the CERN service-tunnel
- Tilted beamline coming up from the machine

Jura (west) side

Cost study:

Eliseo Perez-Duenas GS/SE



Proposed layout to fit the TSR:
 Installation above the CERN service-tunnel
 Tilted beamline coming up from the machine.

Courtesy E. Siesling



Technical integration study

* Study group E. Siesling, E. Piselli, F. Wenander → **NEXT TALK**

Mandate - a report covering the following aspects should be prepared:

An **inventory of all equipment to be brought to CERN** for installation.

Initial **estimates for the infrastructure needed for the ring and its transfer lines**. This should include the overall space, power, cooling and safety needs. It should not include a detailed design of these systems.

For **each system a brief study of the equipment to be installed** should be undertaken after discussion with the experts in Heidelberg and the concerned CERN groups. This study should include:

The **issues associated with the integration** of the equipment into the CERN accelerator environment.

The **spare situation** for the equipment together with any issues or recommendation concerning additional spares.

A **radiological assessment** of the equipment in collaboration with RP.

The **control system presently used** for the system and whether the control hardware must be replaced to meet CERN standards.

Any **specific costs associated with the initial installation**, or the modification to meet CERN standards should be estimated.

* Study running Sep 2012 to Aug 2013

Presented to the RB in Nov. 2013

Tremendeous amount of work done by the integration study team!

- A storage ring at an ISOL facility: a unique instrument
First storage ring with ISOL-facility!
- Possibilities in atomic, nuclear, astro- and neutrino physics
- TSR matches the HIE-ISOLDE characteristics
- The technical aspects of the integration have been studied
- Now awaiting official response from the management...

It is amazing to see what a strong collaboration and an excellent team can reach in about two years. I am sure TSR@ISOLDE will become a success story.

Thanks a lot for your attention!

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