1st panel discussion

Topics I and III, chair A. Jokinen

- L. Fraile, Topic I “The formation and structure of r-process nuclei”
- R. Page, Topic III “Physics and astrophysics of neutron-deficient nuclei”
- I. Moore, Poster session

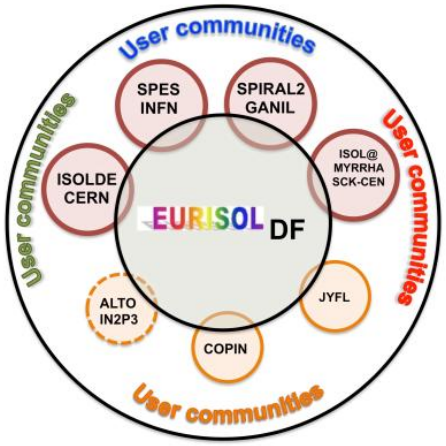
The formation and structure of r-process nuclei, L. Fraile

- Anu Kankainen (JYFL, Jyväskylä) - “The formation and structure of r-process nuclei”
- Olivier Sorlin (GANIL, Caen) - “Experiments studies related to i and r process nucleosynthesis”
- Marius Eichler (TU, Darmstadt) - “The (hot) r-process scenario: from reaction equilibria to kilonovae”

Physics and astrophysics of neutron-deficient nuclei, R. Page

- David Joss (University of Liverpool)- "Structure of heavy neutron-deficient nuclei near the proton drip line"
- David Jenkins (University of York) - "Probing isospin non-conserving forces in nuclei through studies of isospin triplets “
- Emmanuel Clement (GANIL, Caen) - “Physics and astrophysics of neutron deficient nuclei”

EURISOL – Distributed Facility (DF) Initiative



Core members :

- **HIE-ISOLDE/CERN**
- **SPES-INFN**
- **SPIRAL2-GANIL**
- **ISOL@MYRRHA-SCK*CEN**

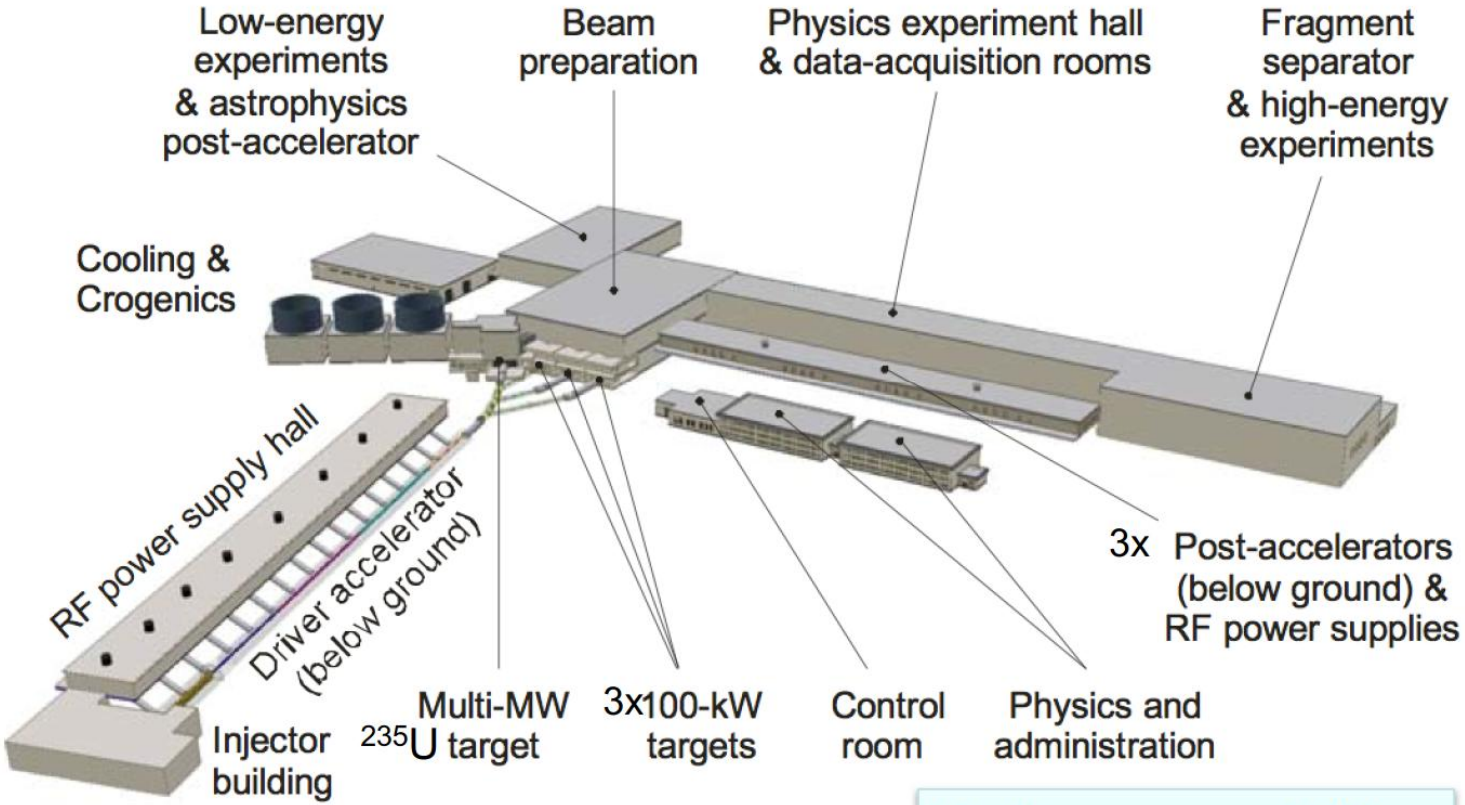
Associated Members

- **JYFL, Finland**
- **COPIN Consortium, Poland**
- **(ALTO, Orsay)**

EURISOL DF

What is EURISOL ?

Up to 150 AMeV for ^{132}Sn



LINAC: H, D, He and A/q=2 ions up to 1 A GeV

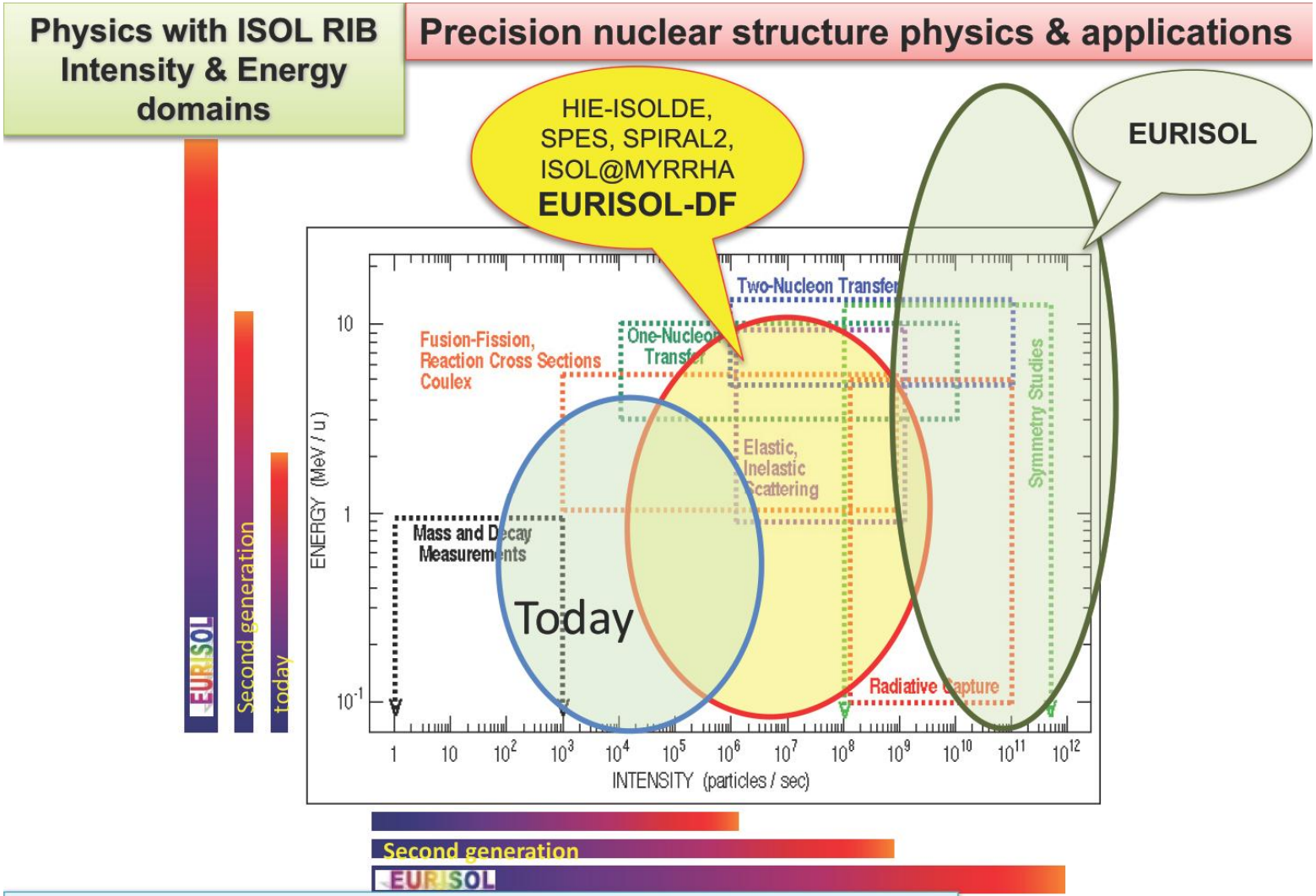
Multi-user capabilities

Cost: > 1.3B€

M. Lewitowicz

Physics with ISOL RIB Intensity & Energy domains

Precision nuclear structure physics & applications

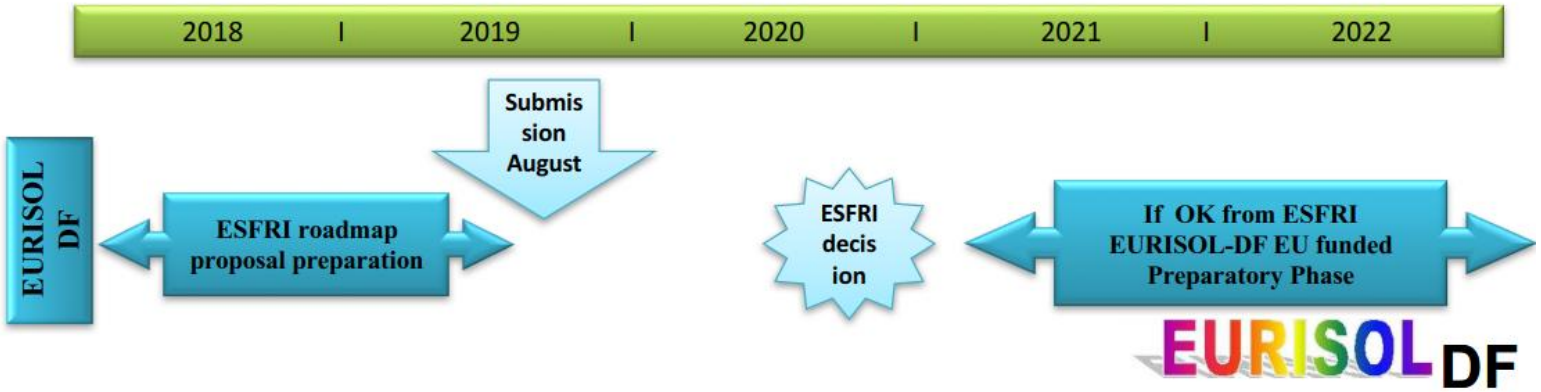


-> EURISOL-DF (Distributed Facility) Initiative from 2014 as an intermediate step towards EURISOL

EURISOL DF

EURISOL – Distributed Facility (DF) Initiative – next steps (2/2)

- Lobbying and green light from the labs and at least 3 countries by **November 2018**
- Draft of the full EURISOL-DF proposal by **January 2019**
- Consultation of the draft with the involved countries and community with an involvement of the EURISOL User Executive Committee: **March-July 2019**
- Submission of the EURISOL-DF project to ESFRI by **July-August 2019 (dead-line August 2019)**



The goals of EURISOL-DF project (1/3)

- Implement a **new scientific policy** tackling major problems in nuclear physics at ISOL-based European facilities and in particular:
  - organise **experimental campaigns** using all available observables, techniques, facilities (at least two) and theoretical approaches to answer key questions in nuclear structure (eg. modifications of magic numbers in nuclei far from stability) and astrophysics (eg. genesis of middle to heavy mass elements in the Universe) ;
  - have a single entry point for **a significant fraction (up to 50%) of the Radioactive Ion beamtime** dedicated at ISOLDE-CERN, SPIRAL2-GANIL & SPES-INFN for the EURISOL-DF experiments and distributed via the EURISOL-DF Program Advisory Committee;

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The goals of EURISOL-DF project (2/3)

- Develop **R&D on RIB production and instrumentation** towards EURISOL and in particular:
  - organise and open to all EURISOL-DF members the R&D platforms to develop RIB (ex. ion sources, targets, separation techniques) and detector systems;
- Promote **user driven policy** with an important role played by the **EURISOL User Group** and the EURISOL Instrumentation Coordination Committee in order to organise and optimize the campaigns of travelling detectors and arrays;

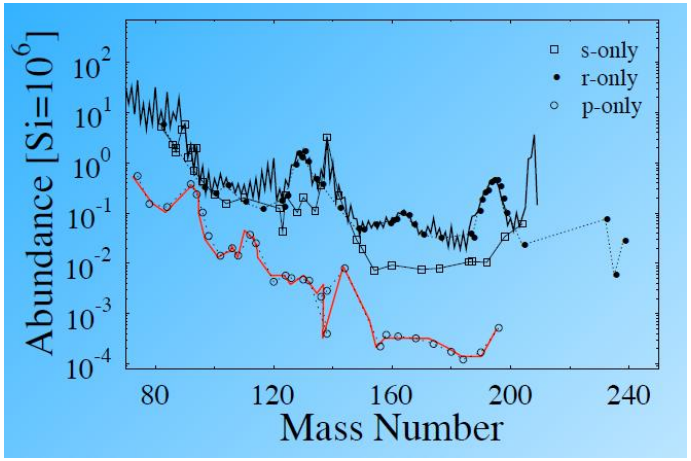
EURISOL DF

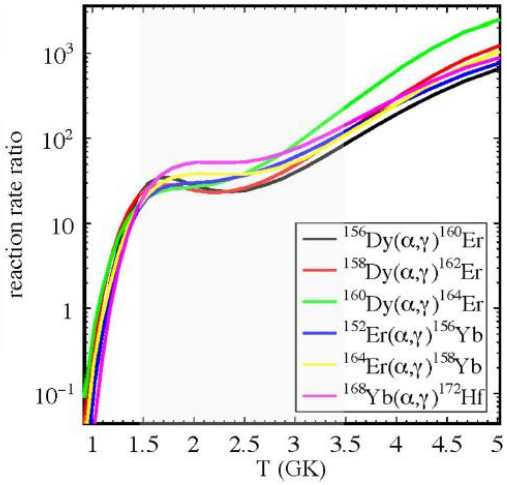
Comments from poster session related to topics I and III, I. Moore

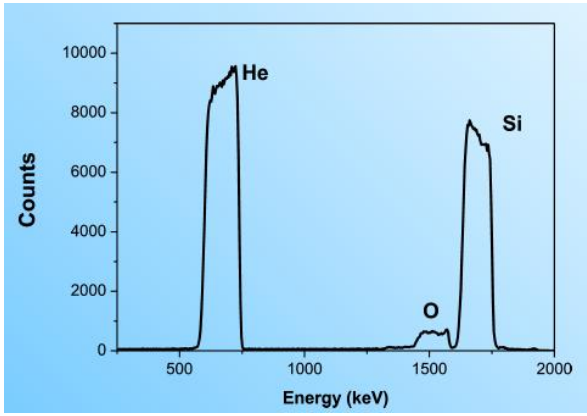
Topic III: Physics & astrophysics of n-def nuclei

D. Redondo – ``*Alpha-elastic scattering in inverse kinematics for the p process´´*

p-process nuclei produced in the O/Ne layer of Supernovae Type II explosions







- Sensitivity studies - the abundance distribution is most sensitive to α-nuclear potential
- Advances in sputtering allowed production of self-supported Si films with large amounts of ^{4}He (~10^{18} atoms/cm^2)
- Such targets can be used in nuclear reaction experiments: to measure elastic scattering, determine nuclear optical potentials – lead to RIBs and inverse scattering, state-of-the-art cp detectors (large solid angle)

Topic III: Physics & astrophysics of n-def nuclei

L. Ferreira – ``*Microscopic description of proton emitters´´*

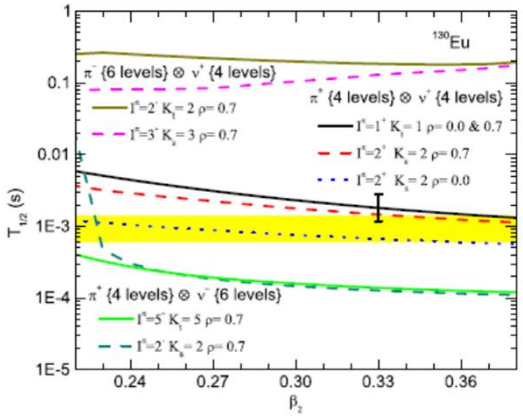
Predicting nuclear structure at the extremes of stability

Relativistic mean field with density functionals

- *relativistic HFB, a unified framework for relativistic mean field and pairing*
- *prediction of nuclear structure, spectroscopic factors, proton radioactivity*

Non-relativistic models (non-adiabatic quasi-particle model)

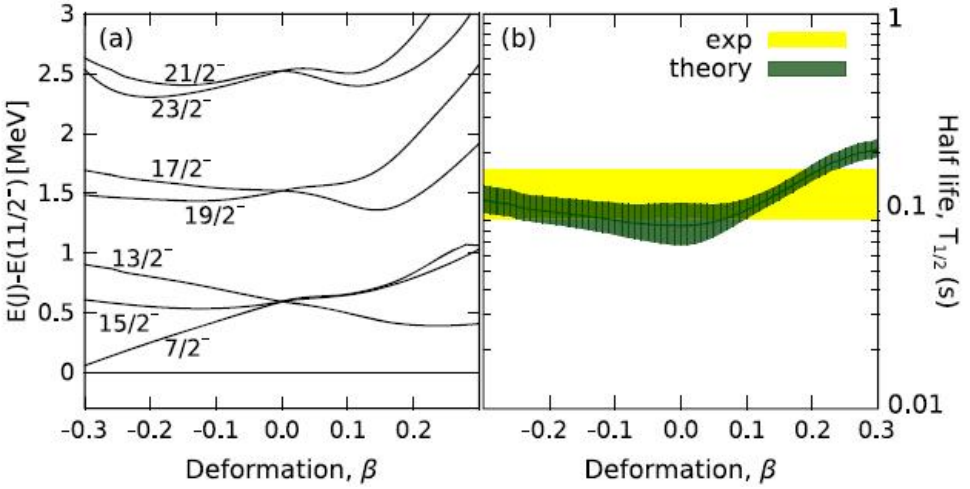
- *proton in single-particle Nilsson resonance with deformed core, excitation spectrum of daughter taken into account*

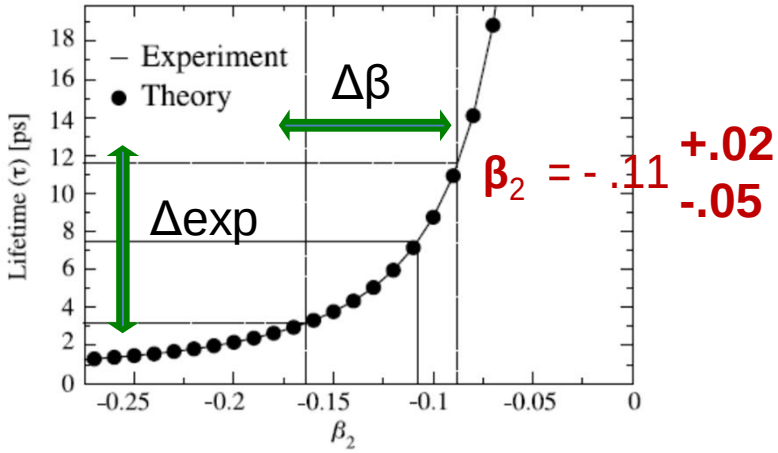


Odd-odd ^{130}Eu: identify decay state and shape

Patial, Arumugama, Jain, Maglione, Ferreira, PRC88 (2013)054302

Find decaying state and def. of ^{151}Lu

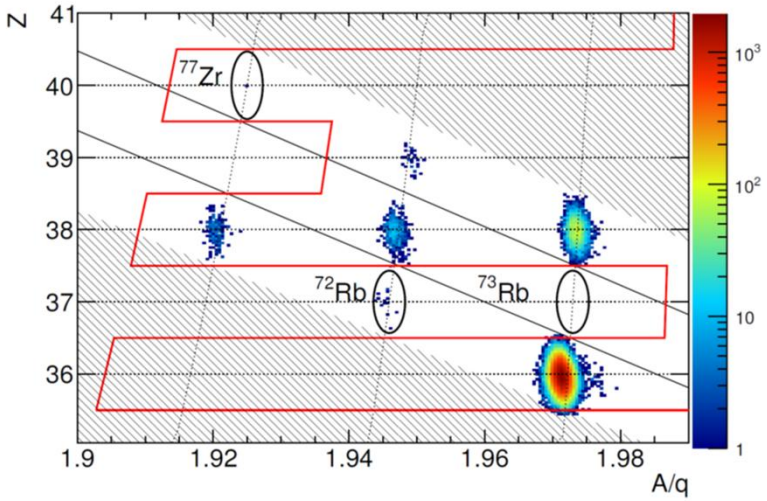


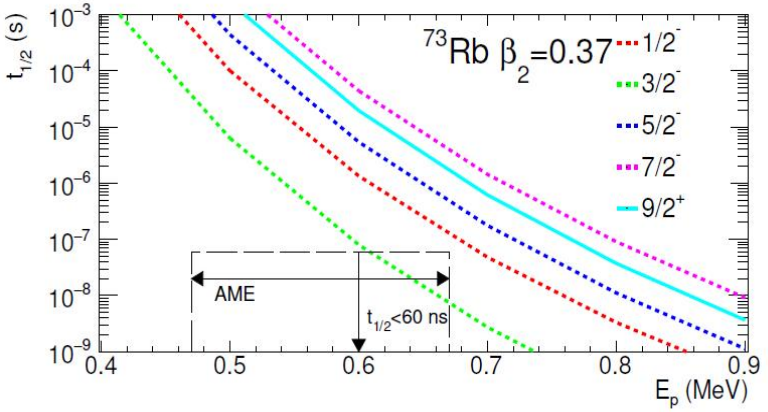


$\beta_2 = -.11^{+.02}_{-.05}$

Cullen, Ferreira, Maglione et al., PLB 725 (2013) 79
Cullen,Ferreira, Maglione et al., PRC 91 (2015) 044322

Discovery of ^{72}Rb and $t_{1/2}$ limit of ^{73}Rb





Suzuki, Sinclair, Söderström, Lorusso, Davies, Ferreira, Maglione et al Phys. Rev. Lett 119 (2017)192503