



JRA-04 Detection of Low Energy Particles from Exotic β -decays - (DLEP)

CSIC, IEM, Madrid,
Spain O. Tengblad

University of Jyväskylä,
Finland J. Äystö

Chalmers University of Technology
Göteborg, Sweden B. Jonson

MESYTEC
<http://www.mesytec.de>

Micron Semiconductors
UK <http://www.micronsemiconductor.co.uk/>

University of Århus,
Denmark K. Riisager

University of York,
UK B.R. Fulton

Acqiris
<http://www.acqiris.com/>

ISOLDE-CERN





Physics motivation β -decays of exotic nuclei

- β -decays of drip-line nuclei
 - Many open channels with particle emission
 - Charged particles (p,d,t, α , ${}^6\text{He}$,...)
 - Neutrons
 - Multiparticle emission (2-4n,2 α ,2p...)
 - Often low energy (< 1MeV)



Need high segmentation and PID



Need dedicated effort for
*Detection of Low Energy Particles
from Exotic β -decays*



I3 EURONS



The collaboration:
Large "know how" from, experiments
on ${}^6,8\text{He}$, ${}^{8-11}\text{Li}$, ${}^{12}\text{B}$, ${}^9\text{C}$, ${}^{12}\text{N}$
& from detector developments



Tandem accelerator, workshop,
particle detector development



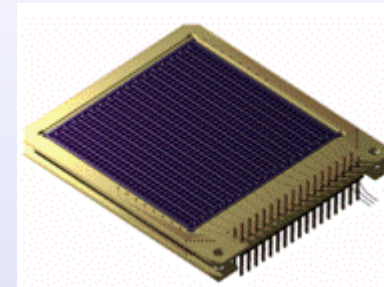
Small tandem and test facilities,
computing, simulation experience



Test facilities, workshop
Neutron detectors



RIB, infrastructure,



Test facilities, computing
detector workshop





JRA-04 Detection of Low Energy Particles from Exotic β -decays - (DLEP)

Start date (or event):

1. Jan. 2005 (begin of I3 EURONS)

Participant No.	25 (Coord.)		4		22		37		44		Sum	
Participant short name	CSIC		JYU		UAAR		CHALMERS		U-YORK			
Personelⁱ	EU	PI	EU	PI	EU	PI	EU	PI	EU	PI	EU	PI
18 months	6	6	3	3	6	6	5	5	5	5	25	25
48 months	18	18	12	12	12	12	12	12	12	12	66	66
present	0	0	0	0	0	0	0	0	0	0	0	0
Perosnal k€												
planned	45		39		50		39		39		212	
present	0		0		0		0		0		0	
Other k€												
planned	4		8		10		8		8		38	
present	0		0		0		0		0		0	

Objectives:

Develop charged particle detectors with associated electronics for Digital Particle Identification of low energy charged particles.





Description of work:

Task T-J04-1: Development of new designed charge particle detector

Subtask T-J04-1.1: Test of Si material

Subtask T-J04-1.2: Design of prototype detectors

Subtask T-J04-1.3: Fine tuning of detector design

Task T-J04-2: Digitising electronics and interfacing fast preamplifiers, multiplexing

Subtask T-J04-2.1: Develop High capacity pre-amplifier

Subtask T-J04-2.2: digital mapping of detector signal

Subtask T-J04-2.3: Fine tuning of detection algorithms

Task T-J04-3: Algorithms for pulse shaping and MonteCarlo simulations

Subtask T-J04-3.1: Monte Carlo simulation

Subtask T-J04-3.2: Algorithm development

Subtask T-J04-3.3: Fine tuning of detection algorithms

Task-T_J04-4: Beam development and tests with developed detectors and electronics

Subtask T-J04-4.1: Beam developments JYFL

Subtask T-J04-4.2: Beam tests at tandem accelerator

Subtask T-J04-4.3: On-line tests at JYFL & ISOLDE

I3 EURONS



Milestonesⁱ:	Short title	Date due	Accompl.
M-J04-1.1	Report over material study	12/05	
M-J04-1.2	Report Prototype detector	12/06	
M-J04-1.3	Detector test report	12/07	
M-J04-2.1	Report Fast preamp prototype	12/05	
M-J04-2.2	Report over digital mapping of detector signal	12/06	
M-J04-2.3	Design report	12/07	
M-J04-3.1	Initial algorithm report	12/05	
M-J04-3.2	Test report of possible solutions	12/06	
M-J04-3.3	Report with computer code	12/07	
M-J04-4.1	Report beam developments	12/06	
M-J04-4.2	Report of beam tests	12/06	
M-J04-4.3	Report of on-line test results	12/07	

Deliverable	Short title	Date due	Type
D-J04-1	Report on task T-J04-1 (Development of charge particle detector)	12/07	R/ PU
D-J04-2	Report on task T-J04-2 (Digitising electronics and interfacing fast preamplifiers, multiplexing)	12/07	R/PU
D-J04-3	Report on task T-J04-3 (Algorithms for pulse shaping and MonteCarlo simulations)	12/07	R/PU
D-J04-4	Report on task T-J04-4 (Beam development and tests with developed detectors and electronics)	12/07	R/PU

