

NeuLAND working group report

R3B-EXL collaboration meeting

Konstanze:

Reminder

NeuLAND Simulations

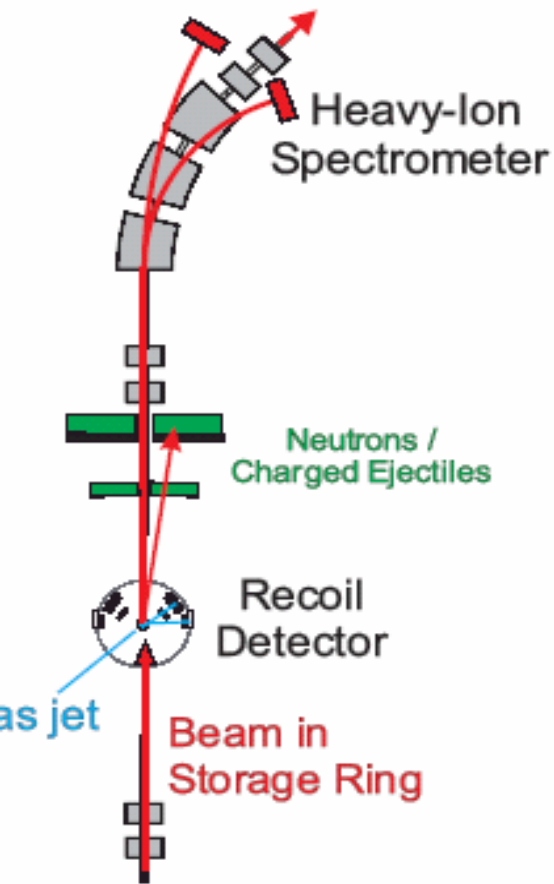
KVI test / GSI test stand preparations

Ushasi:

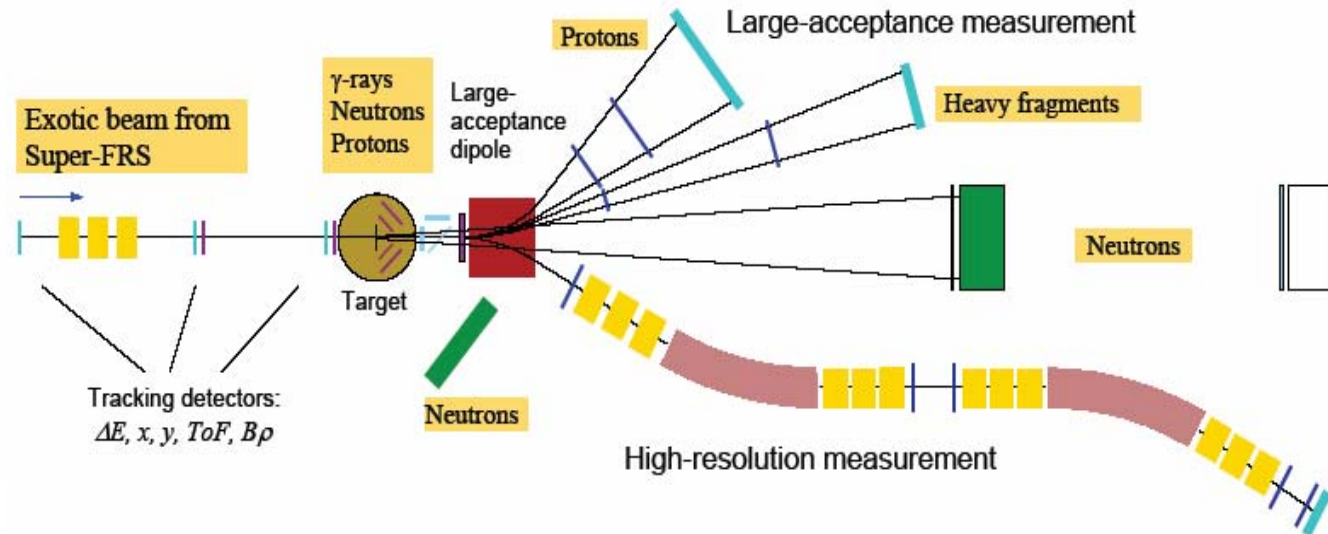
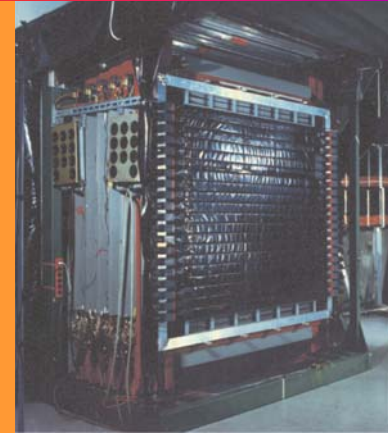
RPC developments

Funding situation India

NeuLAND for R3B and EXL



- ⇒ time resolution $\sigma t < 100$ ps
- ⇒ positional resolution $\Delta x, y, z \sim 3$ cm
- ⇒ gain in multi-neutron recognition



Reminder on Detector Concept

- $2 \times 2 \text{ m}^2$, $< 1 \text{ m}$ depth
- modular structure based on RPC's and converter
- ~ 35 alternating layers of iron and RPC structures
- $\sim 140 \text{ m}^2$
- ~ 10.000 channels
- scintillator concept as backup solution

Working Packages

- 1) RPC tests for response to neutrons respectively neutron induced particles
- 2) Simulations on RPC response
- 3) Simulations on neutron induced hadronic shower properties
- 4) Simulations on the detector array comprising converter and active modules (RPC or scintillator)
- 5) Scintillator tests towards fast timing

- **Future for LAND simulation**

What have we done:

Construct convertor

**Simulations with Fluka and comparisons
with those from TP**

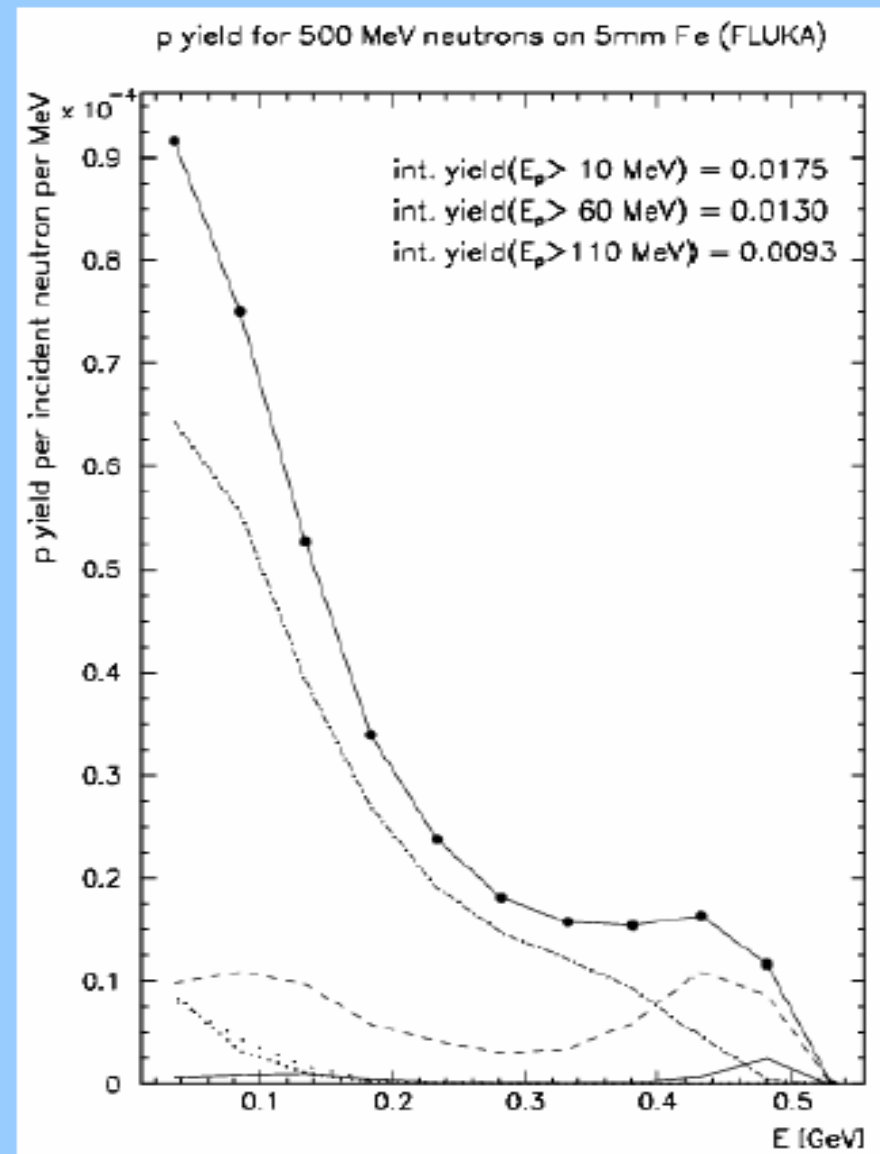
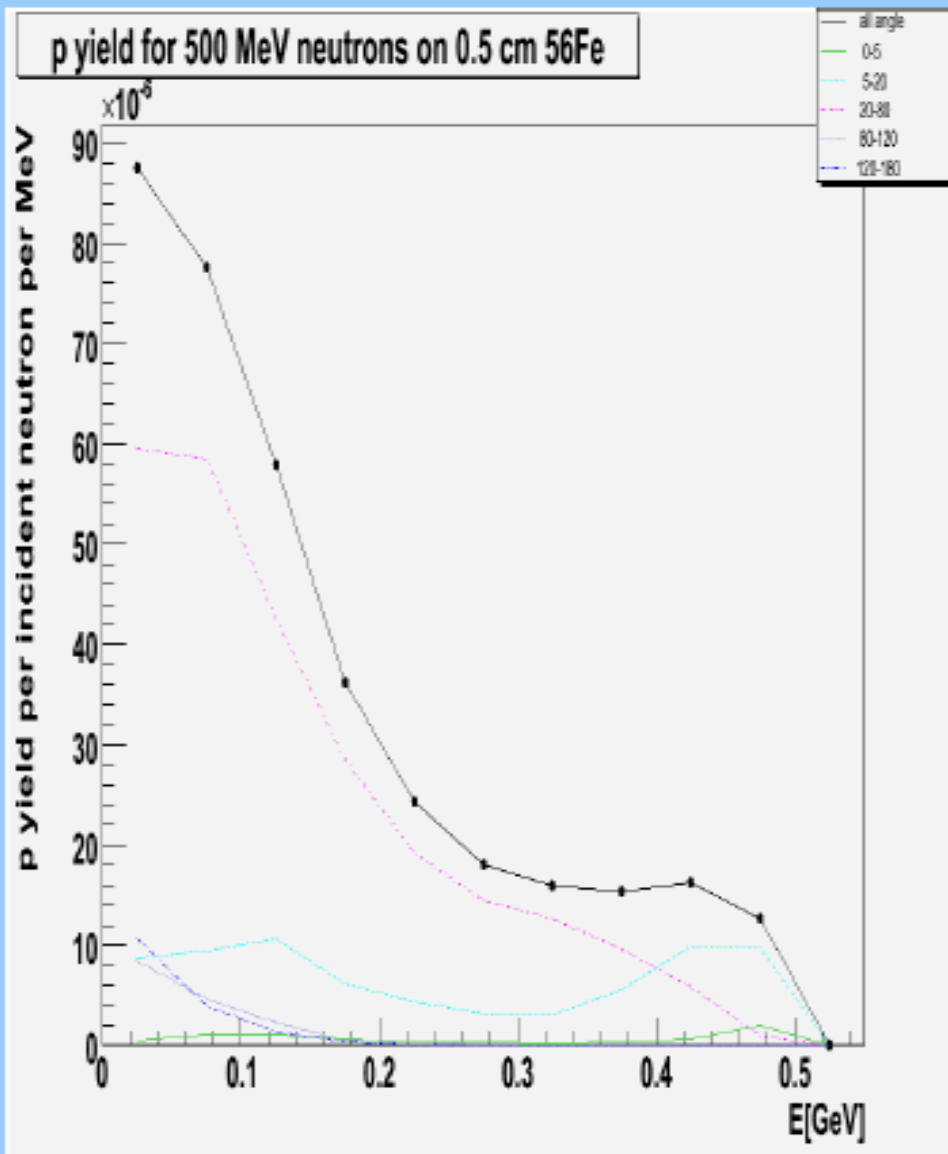
Simulations with GEANT4

**Comparisons between Fluka and
GEANT4**

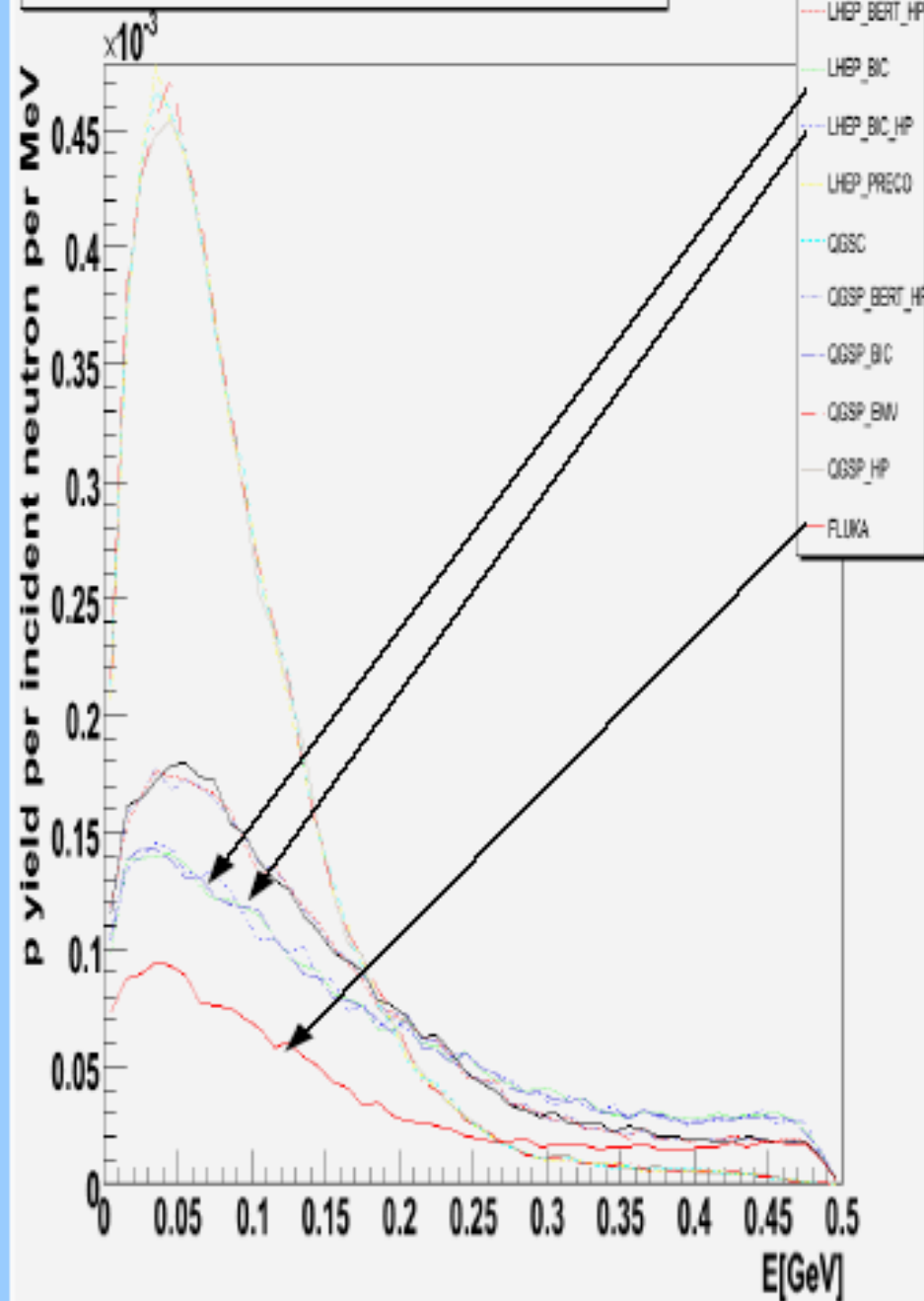
Simulations performed by Madalin Cherciu and Mihai Potlog

ISS Bucharest

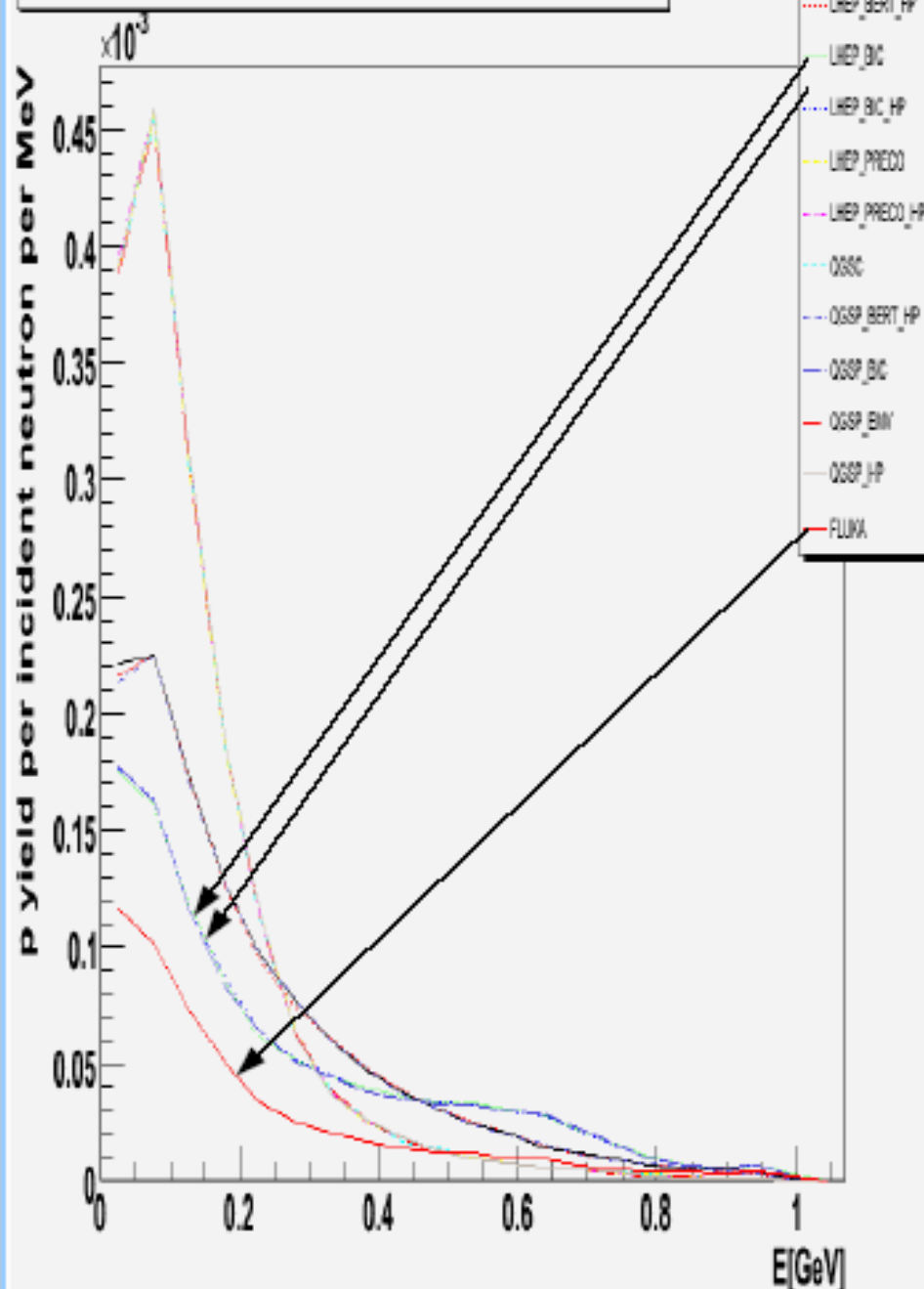
reproducing the FLUKA results from TP



Comparison between GEANT 4 and FLUKA: p yield for 500 MeV neutrons on 0.5 cm 56Fe



Comparison between GEANT 4 and FLUKA: p yield for 1 GeV neutrons on 0.5 cm 56Fe



Saclay test on neutron detection 1987

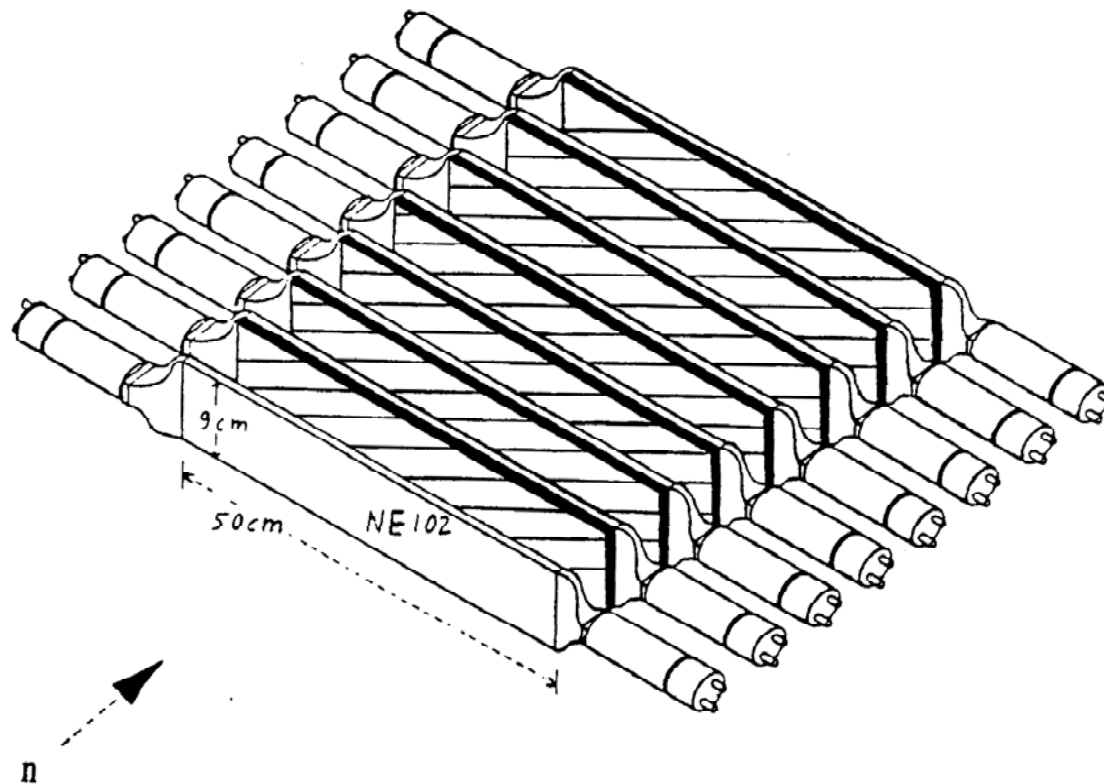
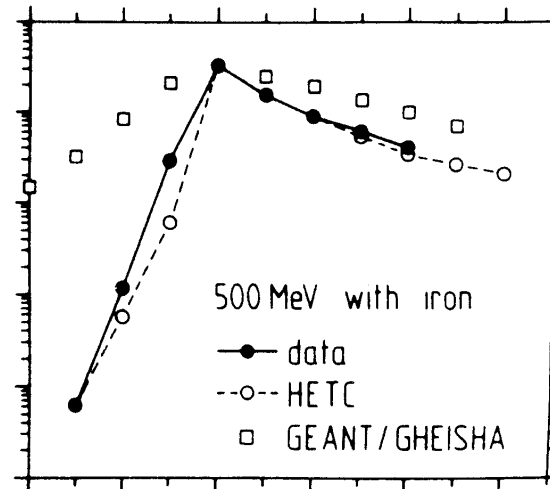
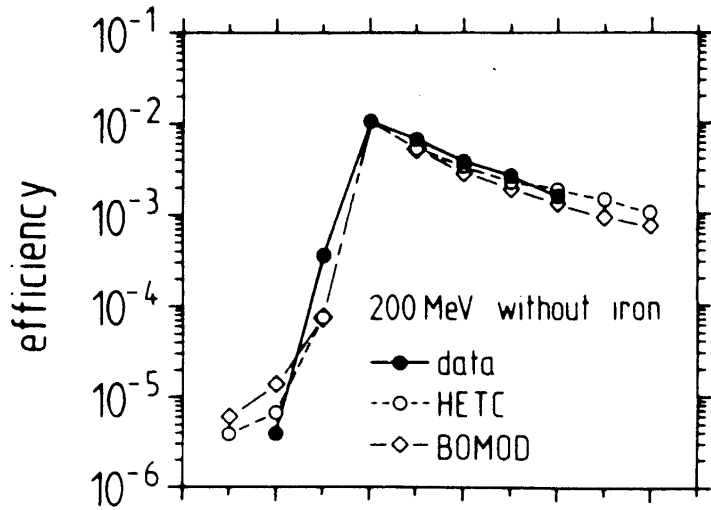
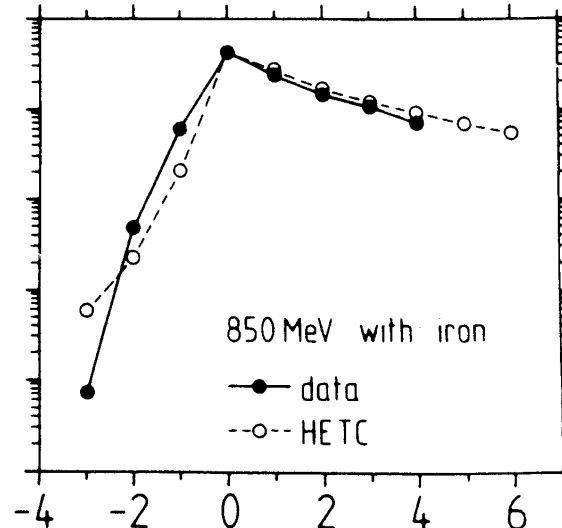
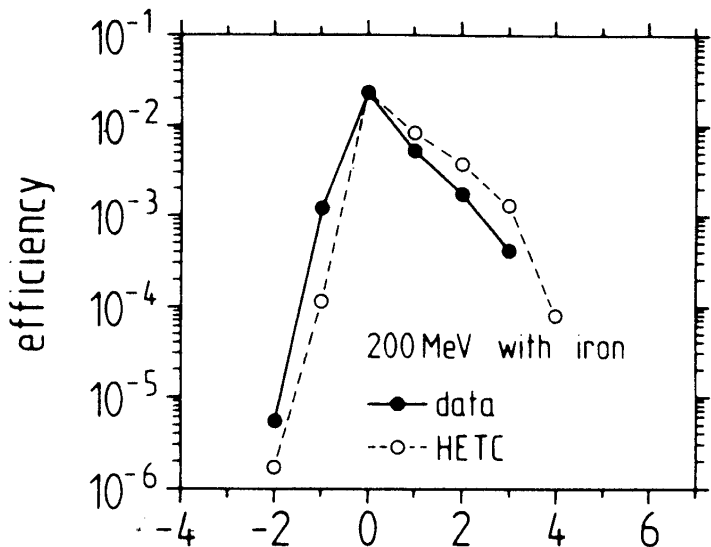


Fig. 1-1: Aufbau des Experiments von Saclay im Juli 1987

Saclay test on neutron detection 1987



from LAND NIM paper,
1992



• Future for LAND simulation

What have we done:

Construct convertor

Simulations with Fluka and comparisons with those from TP

Simulations with GEANT4

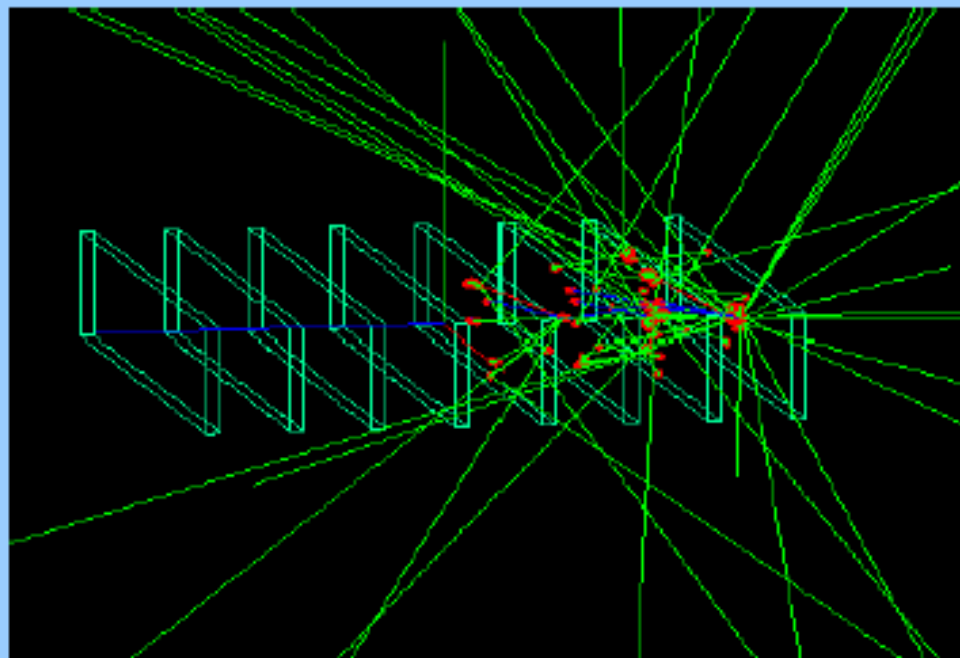
Comparisons between Fluka and GEANT4

Things to do:

Simulation of the Saturne experiment ;
(Nuclear Instrumets & Methods in Physics Research (A314 (1992) 136- 154)

Simulation of an entire paddle;

Simulation of entire new Land;



KVI test experiment: Proposal

Date: 28.10.2005

For KVI use

Exp. No.:

PAC:

Title of experiment:

**Towards a new neutron-detector:
response of resistive plate chambers to protons at various energies**

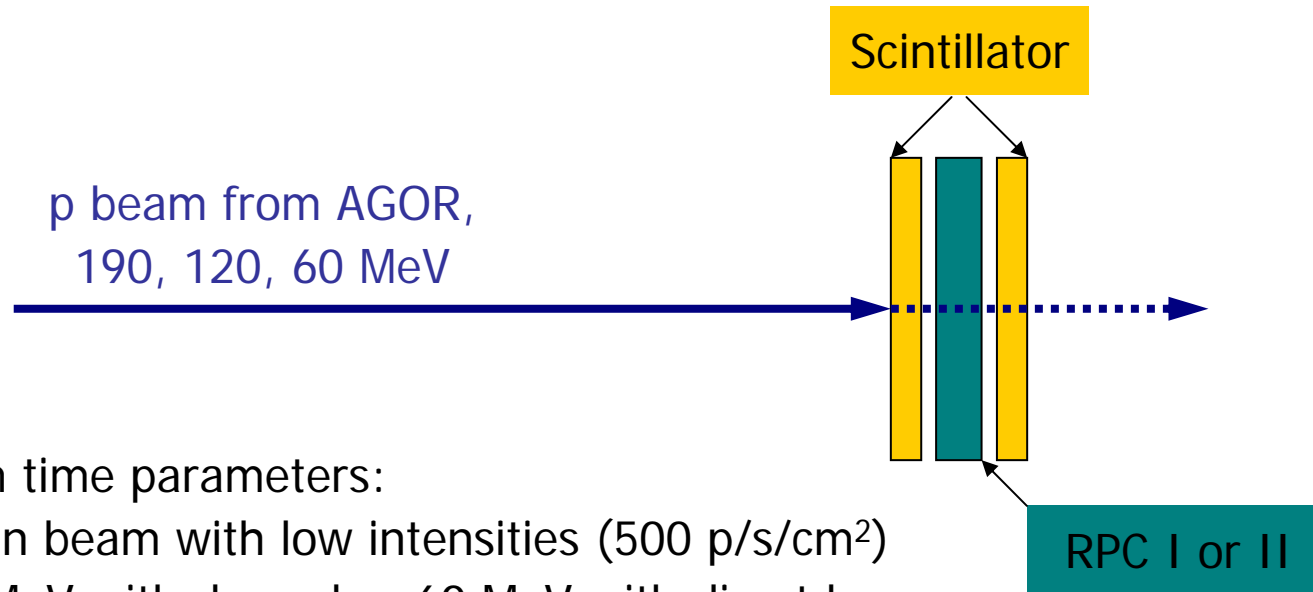
Collaborators :

<u>Name</u>	<u>Institute</u>	<u>Name</u>	<u>Institute</u>
T. Aumann	GSI	K. Boretzky	GSI
K. Hildenbrandt	GSI	H. Simon	GSI
A. Schüttauf	GSI	S. Brandenburg	KVI
N. Kalantar-Nayestanaki	KVI	H. Moeini	KVI
R. Ostendorf	KVI	H. Wörtche	KVI
S. Bhattacharya	Saha I., Kolkata	U. Datta Pramanik	Saha I., Kolkata
J. Jourdan	Univ. Basel	D. Rohe	Univ. Basel

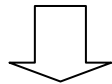
Spokesperson(s)

Name : K. Boretzky
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KVI test experiment



beam time parameters:
proton beam with low intensities (500 p/s/cm^2)
120 MeV with degrader, 60 MeV with direct beam
3 energies, 2 RPC chambers, 3 positions on RPC



Exp.: October 23rd to 26th

KVI test experiment

KVI experiment in Oct. 06

- test of timing and efficiency properties of RPCs (FOPI type, HADES type) for protons at 60, 120 190 MeV
- check signal form (input for the simulations)
- preparation: test stand at GSI – measurements with γ 's and cosmics (packed for transport)

Dominic Rossi, Kripamay Mahata -- GSI
Catherine Rigollet, Heinrich Woertche -- KVI