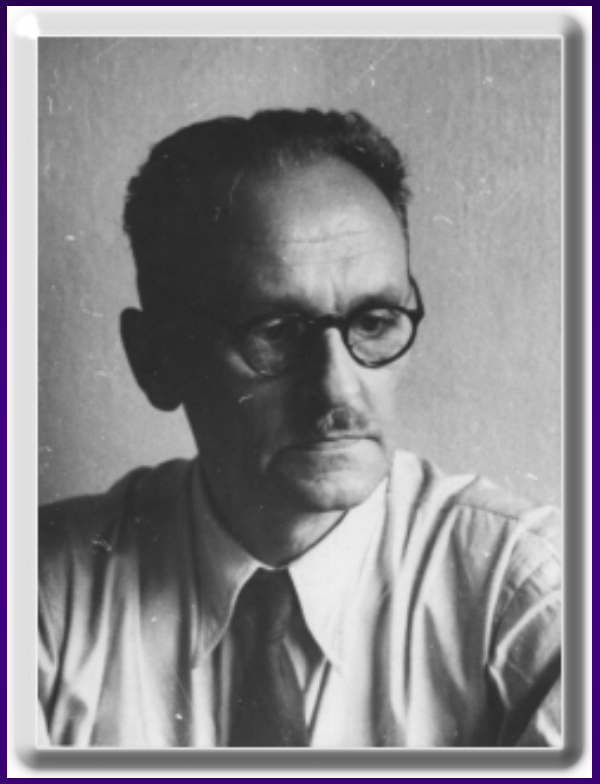
ACCELERATORS ACTIVITY

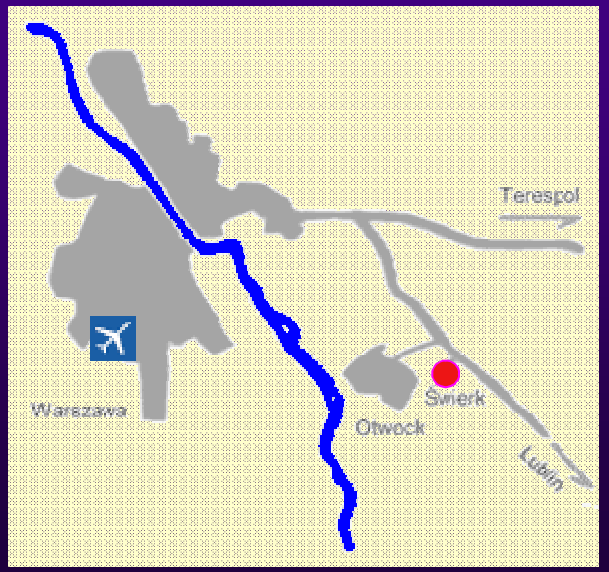
Experience at the Soltan Institute for Nuclear Studies POLAND

Sławomir Wronka, 1-Dec-09r



Prof.
Andrzej Sołtan
(1897-1959)

Organizer and
the first Head
of the Institute



SINS is an unit of the Świerk Research Center

Nuclear Centre „Świerk”

- **IPJ** – The Andrzej Soltan
  Institute for Nuclear Studies
- **IEA - Institute of Atomic Energy**
- **ZUOP - Department of Radioactive Waste Management**

  - **44 ha area**
  - **1000 people**
  - **30 km from Warsaw centre**

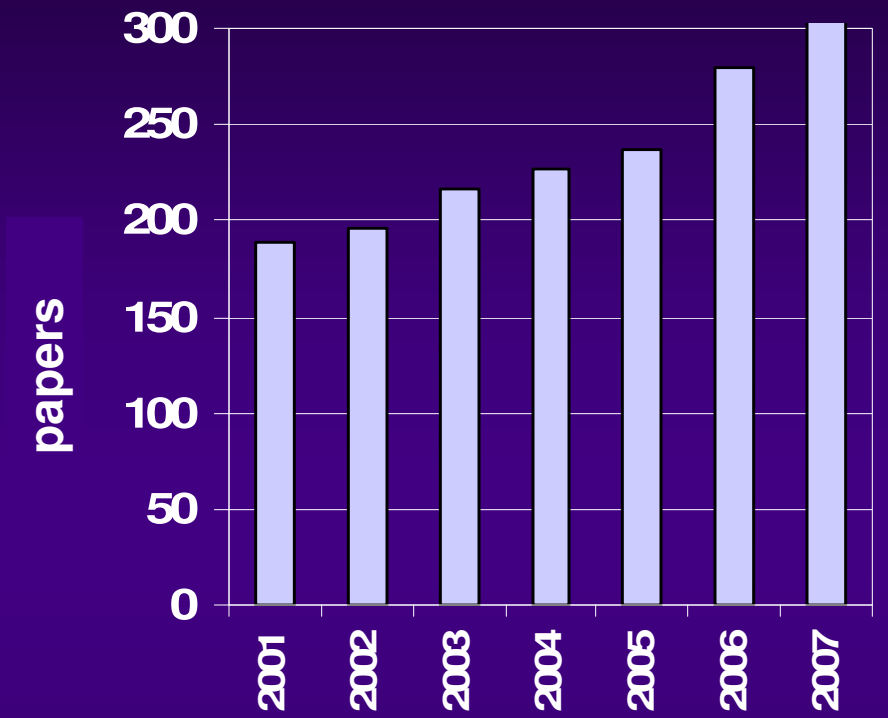
Nuclear Center „Świerk”

IPJ staff: 460 people

139 researchers, including

- 23 professors
- 23 PhD hab.
- 54 PhD

- ~300 papers in 2007



Non-reserach units:

- **Department of Training and Consulting:** 6 people
  - 6500 high school students visiting per year
- **Department of Nuclear Equipement:** 106 people
  - Commercial production unit
- **Transport Division:** 45 people

Research departments

- Nuclear Reactions
- Interdisciplinary Applications of Physics
- Detectors and Nuclear Electronics
- Laboratory for Astroparticle Apparatus
- Plasma Physics and Technology
- High Energy Physics
- Cosmic Ray Physics
- Material Studies
- Accelerator Physics and Technology

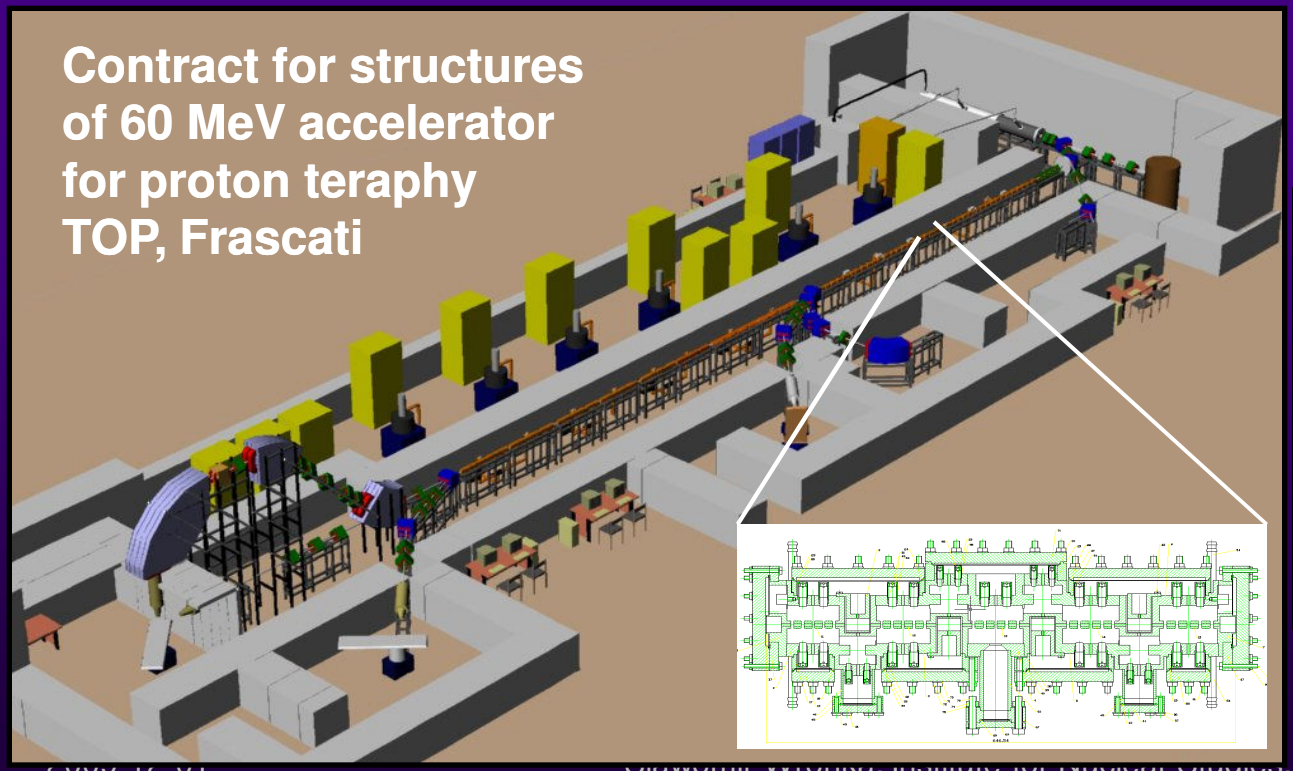
International projects

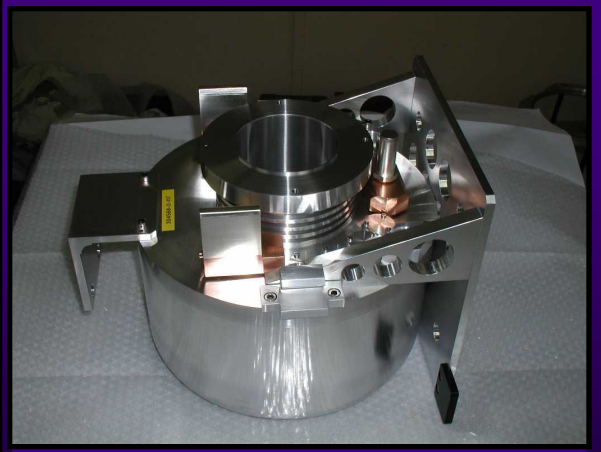
- **CERN:** Compass, NA48, Alice, CMS, LHCb, NA61, SPL
- **DESY:** ZEUS, HERMES, FLASH, XFEL
- **Brookhaven:** RHIC
- **GSI Darmstadt:** FAIR
- **Julich:** WASA, ANKE
- **Karlsruhe:** Kascade, Kascade Grande, LOPES
- **GANIL Caen:** SPIRAL
- **Kamioka, Japan:** T2K
- **Polkowice-Sieroszowice?:** LAGUNA
- **Greifswald:** Stellarator Wendelstein 7-X
- **Cadarache:** ITER
- **Satellite missions:** POLAR, GRIPS

Accelerator technologies

Prototype warm cavities 1.3 GHz for Tesla-FEL, DESY, Hamburg

Contract for structures of 60 MeV accelerator for proton teraphy TOP, Frascati

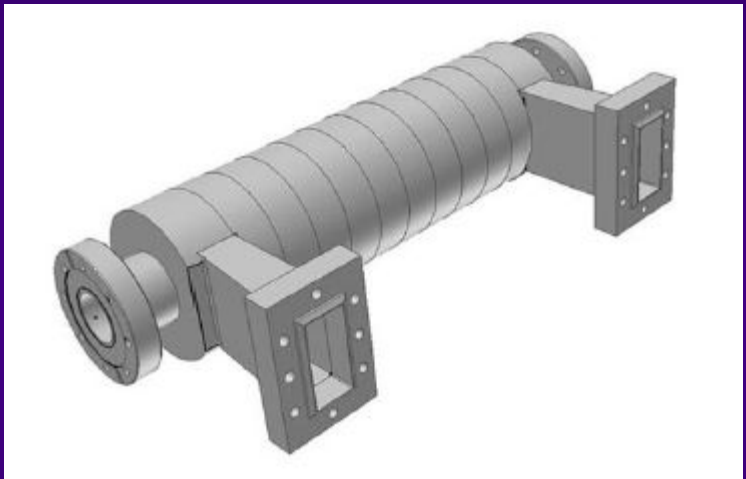




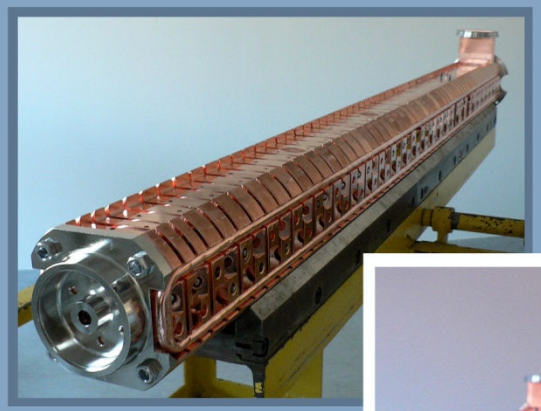
Accelerator target for Isolde, CERN, Genewa

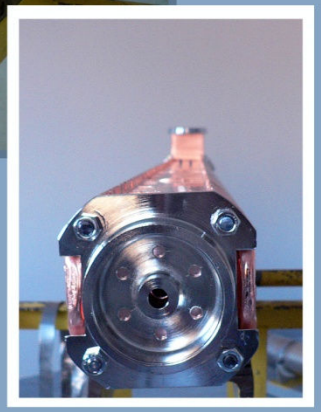
Accelerator technologies

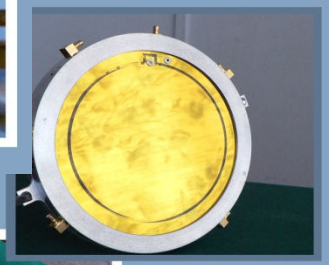
- 3 GHz deflector for CERN CTF3 combiner ring

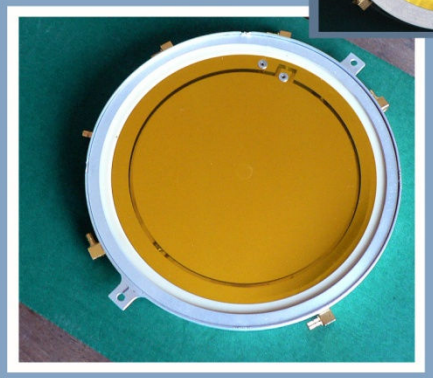


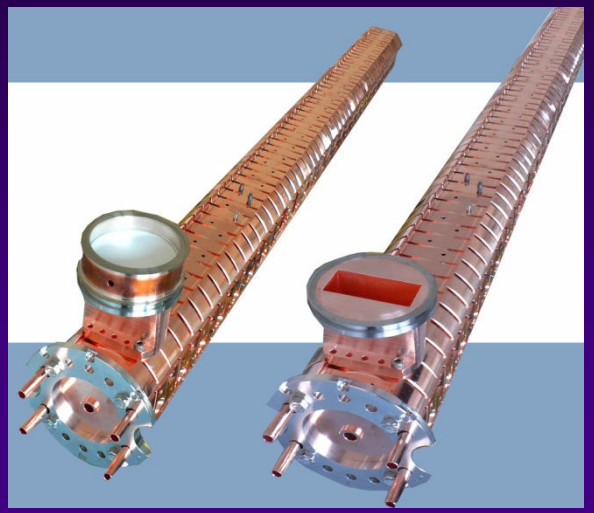
Accelerator technologies

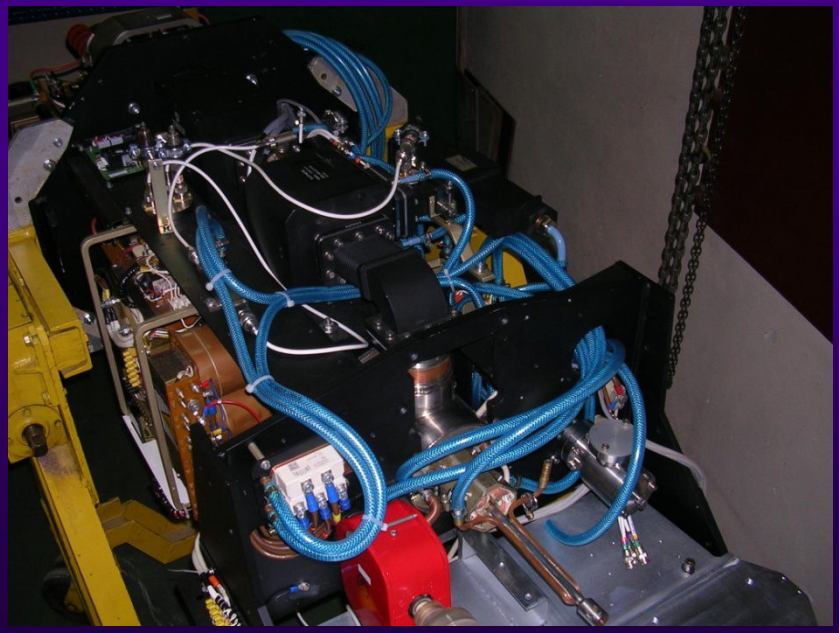












Hitec-Świerk

Accelerators for industry and medicine

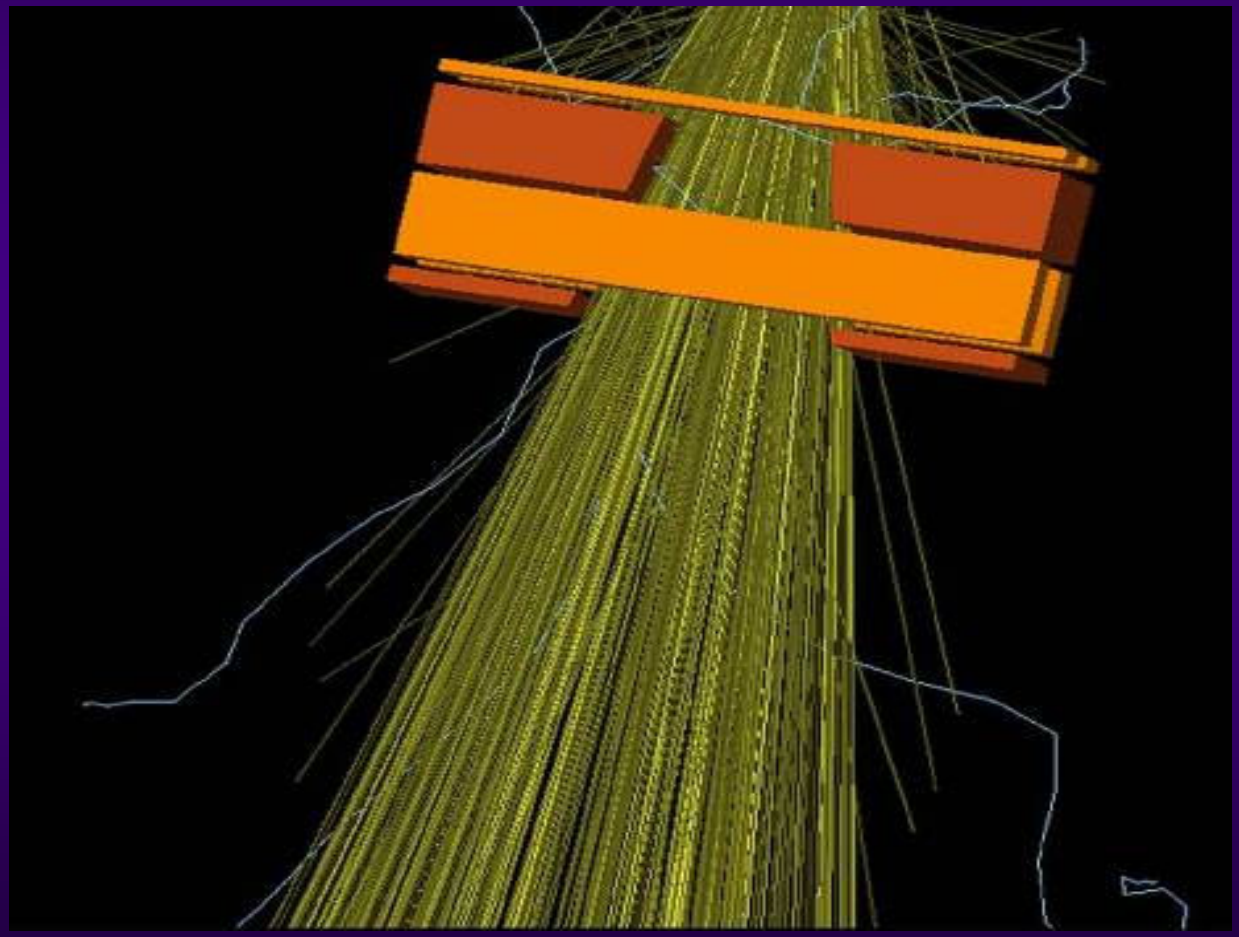
Sterilization
Radiotherapy
Radiography

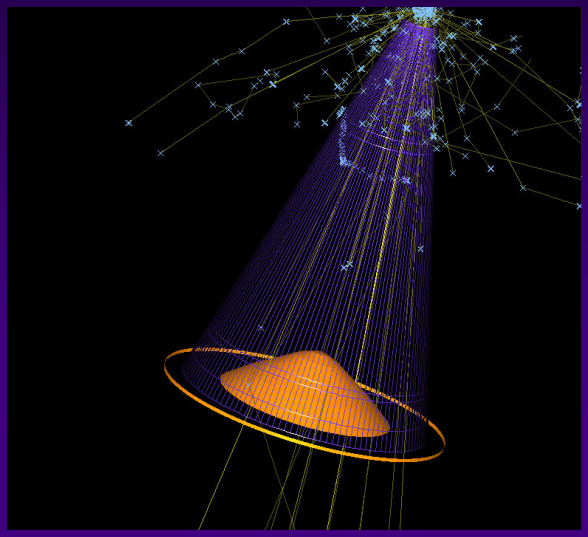
Research & Development

- Designing and manufacturing of different collimators for e^-, n and γ/X beams up to 25MeV

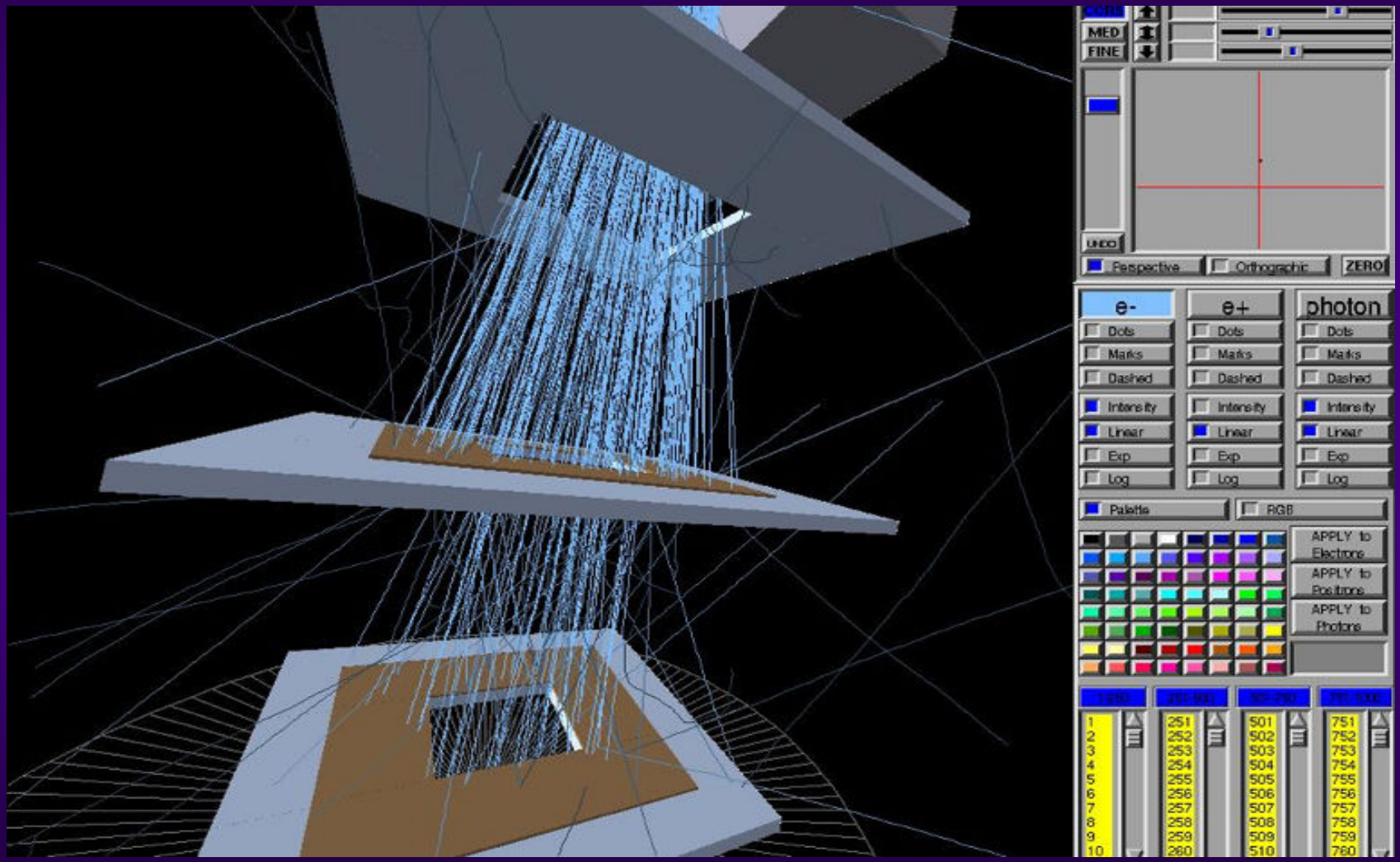
- Calculations, simulations and designing of shelters, radiation centers etc.

Calculations and design

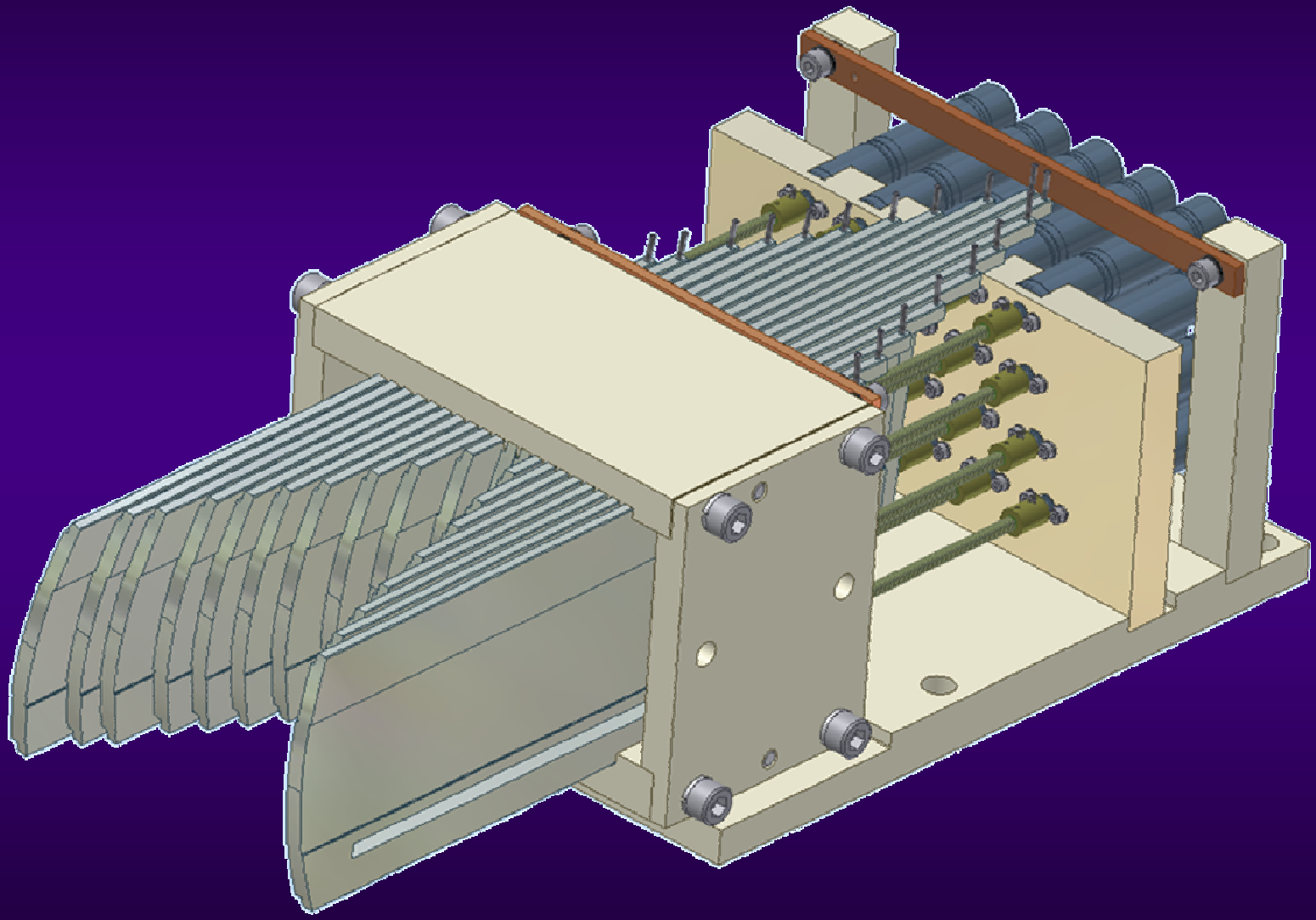




Calculations and design



Calculations and design



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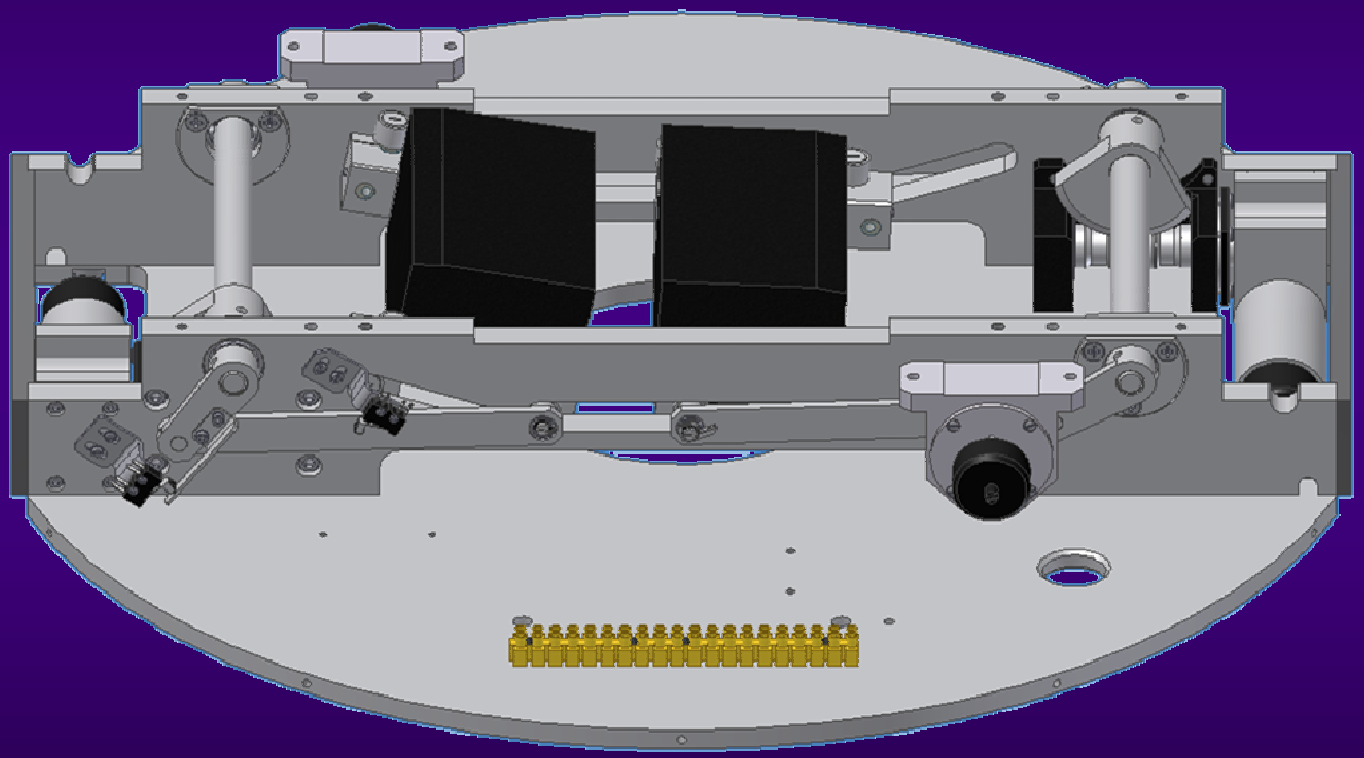
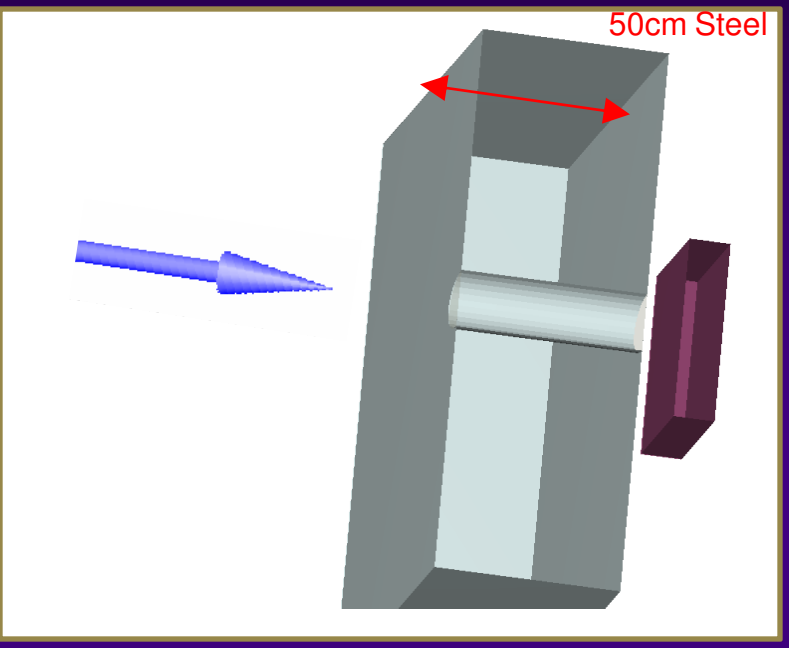
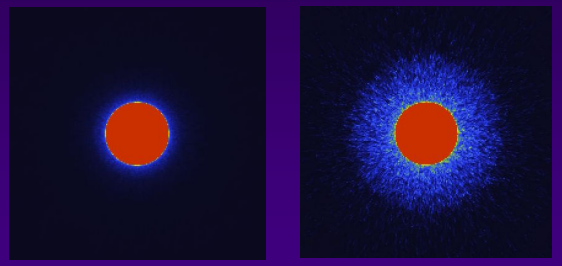


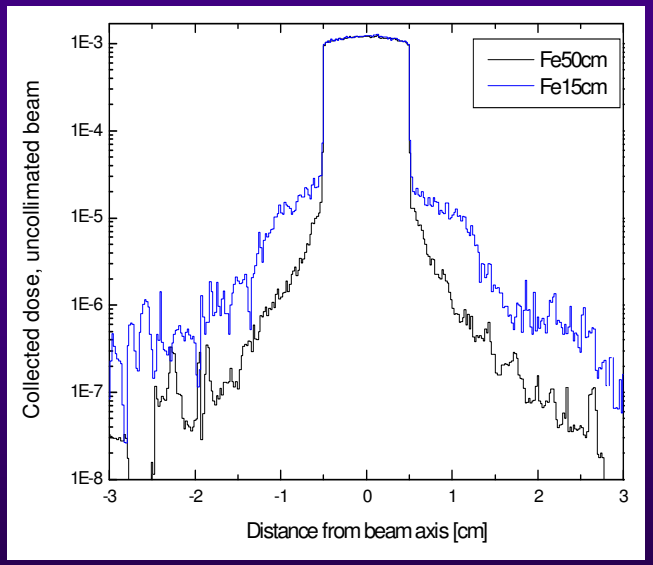
Fluka simulations for SPL

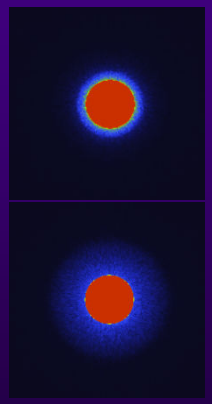


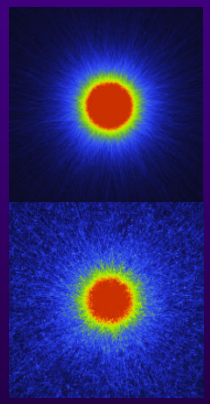
Total dose



50cm 15cm

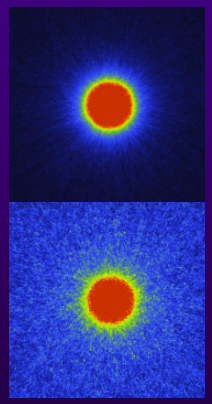






50 cm

15 cm



Protons photons neutrons

Irradiation possibilities in Świerk

- **Nuclear reactor MARIA:**
  - nominal power 30MW,
  - thermal neutron flux density 4×10^{14} n/cm^2·s,
  - moderator H2O, beryllium,

- **Electron linacs:**
  - Electron beams: 4-20 MeV
  - Photon beams: 4-15 MeV

- **Cyclotron:**
  - proton beam 25 MeV