10 DEPARTMENT OF ACCELERATOR PHYSICS AND TECHNOLOGY

Head of Department: MSc. Marian Pachan
phone: (22) 718-05-38
e-mail: p10@ipj.gov.pl

Overview

In view of limited number of scientific and technical staff, it was necessary to focus the activity on most important subjects and to keep balance between current duties and development of future projects.

The dominant item was realisation of research and designing works in the Ordered Project for New Therapeutical Accelerator with two energies of photon beam 6 and 15 MeV.

During the reported year, main efforts were oriented on:

- computation and experimental works on optimization of electron gun parameters and electron optics in the injection system for accelerating structure
- calculation and modelling of standing wave, S-band accelerating structure to achieve broad range of electron energy variation with good phase acceptance and narrow energy spectrum of the output beam
- calculation and design of beam focusing and transport system, with deflection of the output beam for 2700 in achromatic sector magnet
- design and modelling of microwave power system, with pilot generator, klystron 6 MW amplifier, pulse modulator, waveguide system, four-port circulator and automatic frequency control
- preparative works on metrological procedures and apparatus for accelerated beam diagnostics comprising measurements of energy spectrum, beam intensity, transmission factor, leakage radiation, and other important beam parameters.

Other important subject, worth mentioning are:

- Advance in forming and metrology of narrow X-ray photon beams, dedicated to stereotactic radiosurgery and radiotherapy.
- Adaptation of a new version of EGS-4, MC type code for computer simulation of dose distribution in therapeutical beams.
- Participation in selected items of the TESLA Project in cooperation with DESY - Hamburg:
  - theory and computer simulation of higher order modes in superconducting accelerating structures
  - technological research of methods and apparatus for thin layer coating of r.f. resonators and subunits in transmission circuits
- Conceptual studies of proposed new version of prebunchers and bunching structure for injector linac in Trieste synchrotron.

It is also worthwhile to notice the important proposal for research and construction works on a new electron accelerator with high beam power dedicated to radiation technology.

The offer for this project was presented in the frame of Multiyear Programme "ISOTOPES AND ACCELERATORS".

Most interesting results of recent works, were presented at the 7th European Particle Accelerator Conference EPAC 2000 - Vienna.