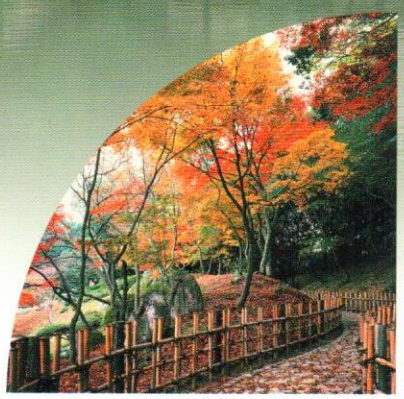
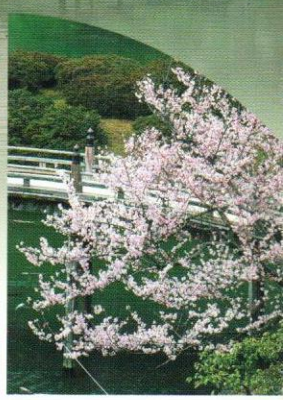
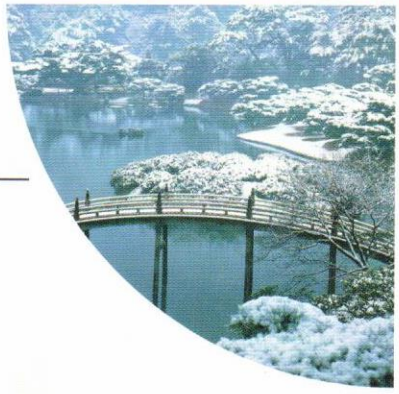
12th International Congress on Neutron Capture Therapy

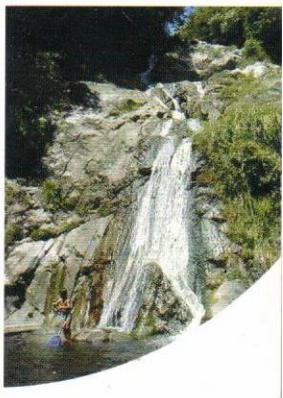
"From the past to the future"

Program & Abstracts









October 9-13, 2006

Takamatsu, Kagawa, Japan

- Kagawa International Conference Hall
- Sunport Takamatsu

P-49(PE)

BINP pilot accelerator-based neutron source for neutron capture therapy

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Accelerator-based neutron source has been proposed for neutron capture therapy at hospital [1]. Innovative approach is based upon vacuum insulation tandem accelerator and near threshold $^{7}Li(p,n)^{7}Be$ neutron generation.
Pilot innovative accelerator based neutron source is under going to start operating now at BINP, Novosibirsk. Negative ion source with Penning geometry of electrodes has been manufactured and a dc H^- ion beam of up to 15 mA has been obtained with the source prototype. Study of beam transport was carried out using prototype of tandem accelerator. Tandem accelerator and ion optical channels have been manufactured and are being assembled now. Neutron producing target has been manufactured, thermal regimes of target were studied, and lithium evaporation on target substrate was realized.
In the report, the pilot facility design is given and design features of facility components are discussed. Current status of project realization, results of experiments and simulations are presented. Obtaining of the proton beam is planned by May, 2006.

[1] B. Bayanov et al., Nucl. Instr. and Meth. in Phys. Res. A 413 (1998) 397.

P-50(PE)

Current status of the accelerator-driven LNL BNCT project

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An accelerator-driven, thermal neutron beam facility, is foreseen to be installed in the next years at the INFN Laboratori Nazionali di Legnaro (LNL), mainly focused on the BNCT of extended skin melanoma experimental treatment. The intense beam delivered by the 5 MeV, 30 mA RFQ proton driver, currently under construction, will be employed. After feasibility studies lasted two years, an original, beryllium-based, target concept has thus been designed, in collaboration with the STC Sintez of Efremov Institute in S. Petersburg, The first, full-scale prototype, constructed at the end of 2004, already passed a series of both operative and critical, e-beam full-power test conditions on spring 2005. The Accelerator-Based Beam Shaping Assembly (AB-BSA) modeling, currently underway, will exploit the useful experience gained in the last years at the LNL CN Van de Graaff driven, low power, demonstration facility. A combined boron neutron capture plus photodynamic (BNCT+PDT) therapy approach is being investigated, due to the promising photo sensitizers uptake selectivity in tumor tissues. New, boron loaded phthalocyanine as well as porphyrins compounds have been synthesized and a wide in vitro and in vivo radiobiological investigation has already started. Special microdosimetric detectors have been designed and constructed at LNL to provide an on-line therapeutic neutron beam monitor, to properly account for all the BNCT dose components and their qualities. Both microdosimetric and radiobiological measurements are being performed at the new HYTHOR thermal column at the ENEA-Casaccia TAPIRO reactor, being fully operating since June 2005.

P-51(PE)

Neutron source with FFAG-ERIT

Yoshiharu Mori, Yoshinori Sakurai, Isao Murata, Hiroyuki Miyamaru, T Hori, M Yoshiie, Hiroshi Yashima, Tomonori Uesugi, Masamitus Aiba, Koto Okabe, Hisaharu Sakae, Yoshimasa Yuasa, Yasuo Satoh, Hiroaki Sakurabata, Satoshi Muraki, Takahisa Nagayama (Research Reactor Instiute, Kyoto Univerisy, Osaka, Japan)

A new type of neutron source with FFAG accelerator/storage ring with ERIT (emittance recovery internal target) scheme is presented. The FFAG-ERIT scheme is based on the ionization cooling to avoid an emittance growth due to multiple scattering between protons and target electrons.