ACCELERATOR BASED NEUTRON SOURCE FOR THE NEUTRON CAPTURE THERAPY AT HOSPITAL

B. Bayanov, Yu. Belchenko, V. Belov, M. Bokhovko[*], G. Dimov, V. Kononov[*], O. Kononov[*], N. Kuksanov, V. Palchikov, P. Petrov, R. Salimov, G. Silvestrov, V. Shirokov, A. Skrinsky, N. Soloviov[*], I. Sorokin, G. Smirnov, A. Sysoev[^], and S. Taskaev. BINP, 11 Lavrentiev ave., Novosibirsk, Russia; [*]IPPE, Obninsk, Russia, [^]MRRC, Obninsk, Russia.

Accelerator source of epithermal neutrons for the hospital-based boron neutron capture therapy is proposed and discussed. Kinematically collimated neutrons are produced via near-threshold ^{7}Li(p,n)^{7}Be reaction at proton energies of 1.883 ÷ 1.9 MeV. Steady-state accelerator current of 40 mA allows to provide therapeutically useful beams with treatment times of tens of minutes. The basic components of the facility are a hydrogen negative ion source, an electrostatic tandem accelerator with vacuum insulation, a sectioned rectifier, and a thin lithium neutron generating target on the surface of tungsten disk cooled by liquid metal heat carrier. Design features of facility components are discussed. The possibility of stabilization of proton energy is considered. At proton energy of 2.5 MeV the neutron beam production for NCT usage after moderation is also considered. The project is supported by ISTC. A pool of experience let us consider the project to be feasible.