Consideration of a D-D/D-T Fusion Based Neutron Generator System for Liver BNCT

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Abstract- *Recently, some new applications of BNCT treatments have been introduced. Results have indicated that liver tumors can be treated by BNCT. At Lawrence Berkeley National Laboratory, various compact neutron generators based on D-D or D-T fusion reactions are being developed. Earlier theoretical studies of D-D or D-T neutron generators have produced close to optimal moderator and reflector configuration for brain tumor BNCT. Preliminary studies of the applicability of 2.45 MeV and 14.1 MeV neutrons for external liver tumor BNCT have been carried out. MCNP simulations and SERA dose calculations were performed in order to find the optimal beam shaping assembly. The depth dose distributions were calculated in the liver phantom model and the therapeutic gain was calculated in various depths. The preliminary results were verified with SERA dose calculations in a liver model, based on CT scans of the body. In this presentation, issues of beam optimization for external liver BNCT are considered and preliminary results of SERA dose calculations are presented.*