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Development of 2.45 GHz ECR Proton Source for Compact Accelerator-Driven Neutron Source System

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In order to spread neutron use in industrial field, it is important to provide a compact semi-ready-made neutron source that a company and a factory can easily introduce. Therefore we have studied a compact accelerator-driven neutron source system, which consists of a 2.45 GHz simple-mirror electron cyclotron resonance (ECR) proton source, a four-vane RFQ linac and a lithium target for neutrons production by the Li(p,n)Be reaction. The operating frequency of the proton RFQ linac is 650 MHz and is adopted for downsizing. We designed its specifications through beam trajectory and electromagnetic simulations and fabricated the 2.45 GHz simple-mirror ECR proton source. The details of the neutron source system and the experimental results of the proton source will be presented.

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