Neutronic Research for Boron Neutron Capture Therapy and Investigation of Pancake-like Moderator-Reflector Structure for the Jülich High Brilliance Neutron Source	
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Boron Neutron Capture Therapy (BNCT) is a new type of radiotherapy which has been widely concerned by many researchers. At present, the neutron source for boron neutron capture therapy has been gradually transitioning from reactor neutron source to accelerator neutron source. The development of compact neutron sources for boron neutron capture therapy is the focus of neutron source research. In this seminar, I will present the PhD study on the neutron source facility of Accelerator-based Boron Neutron Capture Therapy, including the development of target, Beam Shaping Assembly (BSA) and related neutron measurement work.

The High Brilliance Neutron Source (HBS) project is developing a high-current accelerator-driven neutron source (HiCANS) to maintain a healthy neutron landscape in Europe. Despite the lower primary neutron yield of the nuclear reactions compared to reactor or spallation neutron sources, HiCANS achieve a competitive neutron brightness by a compact moderator and reflector design, which makes a large fraction of the primary neutron spectrum available for applications. The spectral and temporal, i.e. frequency and pulse length, characteristics of the neutron pulse are tailored to the instruments hosted at a target station. Based on the ‘pancake’ and ‘butterfly’ moderator geometries developed for the European Spallation Source (ESS), we investigate a pancake-like structure by means of Monte Carlo simulations. In this seminar, I will also present the current study of pancake-like moderator-reflector structures. The optimized structure with up to 12 extraction channels in a pancake-like arrangement looks therefore very promising for target stations that serve a large number of thermal and cold instruments.