EUROPEAN SPALLATION SOURCE

Lund, 20th February 2024

ESS Letter of Commitment for the BOBINE Project

The European Spallation Source ERIC (ESS) is one of the largest science and technology infrastructure projects being built today. It is a European Research Infrastructure Consortium (ERIC) listed in the ESFRI roadmap, with 13 Partner Countries committed to constructing and operating the facility. The facility design includes the most powerful linear proton accelerator ever built, a four-tonne, helium-cooled tungsten target wheel, 15 state-of-the-art neutron instruments, laboratories, and a data management and software development centre. Once commissioned to its full specifications, ESS will be the most powerful neutron source in the world, servicing a European user community of almost 10,000 material scientists in the areas of engineering, biology, chemistry, physics, geology and cultural heritage as well as others in industry. ESS employs over 400 staff from 50 different nations, and more than 50 European universities, research institutes and laboratories take part in the ESS collaboration. The ESS has a robust project organization, as well as administration experienced in managing international grants and networks, and it is a member of many internationally and nationally funded research collaborations.

The employment of high magnetic fields and low mK temperatures provides a key tool in the investigation strongly correlated electron phenomena with neutron based techniques. As such, the magnets developed within the project BOBINE will be unique opportunity to strengthen the European large-scale research infrastructure. With a joint European 20T static magnet and a 40T pulsed magnet, both combined with a bespoke mK dilution insert BOBINE will significantly extend the available parameter range towards more extreme sample environment. The project will bring unique opportunities for the exploration of (quantum) disordered systems or exotic electronic ordering phenomena, especially in combination with the latest generation of neutron scattering instruments. - BOBINE will be a key development towards the discovery of exciting new physics. Moreover, the technology employed in BOBINE, based on HTS superconductors, will serve as a prototype for future high performance magnets, with potential use also beyond neutron scattering applications such as quantum computing.

We believe that the BOBINE project provides a very interesting and promising contribution towards a stronger and more competitive European neutron research landscape. We at ESS foresee a strong request from our user community to have access to such a magnetic field and temperature range to address scientific challenges mainly from, but not limited to, the area of information technology and quantum phenomena. We strongly support the BOBINE project and are committed to contribute to the project by providing the infrastructure to conduct the project and the operation of the systems on the neutron scattering beamlines at our facility.

We furthermore are happy to allocate beamtime at our facility for hot commissioning of the magnets in pilot experiments.

Yours sincerely,

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