





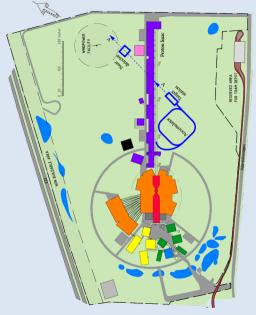
Funded by the Horizon 2020 Framework Programme of the European Union

AND ITS SYNERGY WITH A HIGH INTENSITY FRONTIER INITIATIVE HIFI

- The EU supported ESSnuSB Design Study project proposes to add to the European Spallation Source a Super Beam neutrino facility based on a 5 MW beam from the ESS linac and mainly devoted to the precision measurement of a leptonic CP violation.
- The uniquely high neutrino beam intensity allows for operation exclusively at the **second neutrino oscillation maximum** aiming to cover after 10/20 years data-taking 60%/72% of δ_{CP} values with the reasonable assumption of 5%/10% systematic errors on signal/background. After 10 years of data taking a resolution in δ_{CP} of 13°/6° at δ_{CP} = -90°/0° respectively will be obtained.
- Concurrently with the neutrinos a copious number of muons (>10²¹/year) will be produced, which can be used to realize an extensive High Intensity Frontier Physics program for nuSTORM for neutrino cross-section measurements and sterile neutrino searches and vFactory for precision PMNS parameter measurements
- The ESSnuSB Accumulator ring (radius=68 m) will be used to accumulate the 2.86 ms long linac pulse and extract the accumulated protons in one single turn, resulting in a 1.3 μs long pulse. The same ring can be used as the compressor ring in the first stage of a vFactory at ESS and also for a Muon Collider Higgs Factory.
- Furthermore, 1.3 μ s pulses will allow for π and K Decay at Rest (DAR) experiments and Coherent Neutrino Scattering experiments with very low background.
- Employing slow extraction the Accumulator ring can also be used to generate compressed spallation-neutron pulses of 50 μs length of significant interest for Spallation Neutron Science.



ESS linac and site May 2020



ESSnuSB layout at ESS

Snowmass Town Hall meeting 17 July 2020 Tord Ekelof, Uppsala University