Contribution ID: **148** Type: **Poster**

Muon beamline design on EMuS

China Spallation Neutron Source (CSNS) at Dongguan, China, has been in operation since August 2018. Its accelerator complex delivers a proton beam of 100 kW in beam power, 1.6 GeV in kinetic energy and 25 Hz in repetition rate. The Experimental Muon Source (EMuS) is planned to be constructed from 2022 as a part of the CSNS-II project, and will utilize a proton beam of 25 kW in a standalone mode. Two different schemes for EMuS have been studied, with the Phase-I based on a conventional thick target and side collection, and the future upgrade or the baseline scheme based on a conical target and capture superconducting solenoid. The baseline scheme will provide both surface muon beams and high energy decay muon beams for μSR, muon imaging and muonic X-ray, etc. The muon beam momentum is tunable and covers a wide range from 28 MeV/c to 450 MeV/c. The complex muon beamlines are based on superconducting solenoids, superferric dipoles and room-temperature magnets, and divided into five areas: trunk beamline, surface muon area, decay muon area and low-energy muon area, as well as a vertical beamline from a tandem thin target to provide surface muons. The surface muon area can provide beam for three μSR spectrometers simultaneously with an electrostatic separator, by using the spatial beam splitting method. Three spectrometers or experimental setups in the decay muon area, for muon imaging, μSR, and muonic X-ray, respectively, can share the beam in the beam switch mode. The vertical beamline that offers high polarization surface muons serves only one spectrometer in the platform. The area for slow muons and potential particle physics experiments is also planned. For the Phase-I scheme or simplified scheme, the beamlines are relatively simple, and based on only room-temperature magnets. Only surface muons and cloud negative muons are provided to four endstations with focus on μSR applications and also muonic X-ray analysis. The beam delivery system employs a combined spatial beam splitting and switching method. This presentation will be about the design study of the above two schemes for EMuS.

Working group

WG3

Authors: HONG, Yang (Institute of High Energy Physics, CAS); ZHOU, luping (Institute of High Energy Physics, CAS); TANG, Jingyu (Institute of High Energy Physics, CAS)

Presenter: HONG, Yang (Institute of High Energy Physics, CAS)

Session Classification: Poster session NB: do not use Safari; use Firefox, Chrome or Edge