Search for Hidden Particles at SHiP

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SHiP is recently proposed new general purpose fixed target facility at the SPS which is aimed at exploring the domain of hidden particles and make measurements with tau neutrinos. Hidden particles are predicted by a large number of models beyond the Standard Model. The high intensity of the SPS 400 GeV beam allows probing a wide variety of models containing light long-lived exotic particles with masses O(10) GeV, including very weakly interacting low-energy SUSY states.
Under nominal conditions the current SPS is capable of providing an integrated total of 2×10^{20} protons on target in five years of operation. This allows access to a significant fraction of the unexplored parameter space for the Hidden Sector with sensitivities which are several orders of magnitude better than previous experiments. The associated tau neutrino detector will allow performing a number of unique measurements with tau neutrinos, including a first direct experimental observation of the anti-tau neutrino interactions.

The experimental programme of the SHiP facility is also capable of being extended in future, e.g. to include direct searches for Dark Matter and Lepton Flavour Violation in tau lepton decays.

The SHiP facility will provide a unique experimental platform for physics at the Intensity Frontier which is complimentary to the searches for New Physic at the Energy Frontier.