

The Forward Physics Facility at the LHC

The LHC experiments produce high-intensity TeV-energy neutrino beams close to the proton beam directions. Opportunistic experiments sited in a dedicated cavern several hundred of metres from an LHC interaction point could make use of these beams during the upcoming high-luminosity runs of the LHC.

The pathfinder FASER experiment has recently demonstrated detection of more than 100 neutrinos with TeV-scale energies. The proposed FPF experiments will provide high-statistics data on neutrino DIS cross-sections, on far-forward heavy-hadron production in PP colliders, and on parton distribution functions in the extreme-low-x regime where new phenomena such as saturation are anticipated. These data are uniquely able to make systematic improvements and solve flavour puzzles in cosmic-ray physics. The FASER-2 experiment will have unique sensitivity to a range of weakly-coupled dark sector models. The higher energy of the LHC hadrons provides sensitivity well beyond any existing or proposed beam-dump experiments in many scenarios.

Our priorities in the Forward Physics Facility programme are to:

- a. Complete the mechanical design studies for the FPF Letter of Intent and Technical Proposal
- b. Develop the computing and tracking software for the FASER-2 experiment
- c. Work with UK industry in developing a magnet solution for the FASER-2 spectrometer