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Two beam stability and Landau damping

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In proton colliders, Landau octupoles are used to provide the necessary Landau damping of transverse coherent beam instabilities driven by the impedance. During the operational cycle the tune spread provided by the Landau octupoles may be modified when in presence of beam-beam interactions. Transverse beam stability studies for the FCC-hh operational cycle will be explored using Landau octupoles alone and in presence of beam-beam long range and head-on interactions. In addition, the possibility to use an electron lens to provide the necessary tune spread for beam stability will be analysed and compared to the octupole magnets case. Based on these studies an optimum operational scenario will be proposed to guarantee the maximum stability during the entire FCC-hh operational cycle.

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