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Mixed refrigerant cycle for cooling below 25 K

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The current cryogenic design for the FCC-hh consist of a helium cycle with pre-cooling by the Nelium cycle. Both have their own set of compressors and heat exchangers. The potential of combination of these two distinct cycles with a reduced number of components is investigated. Using efficient turbo compressors requires a mixed refrigerant with a heavier ballast gas to achieve reasonable capital cost for the compressors. On the other hand, the ballast gas has to be removed from the helium if refrigeration at LHe temperatures is requested. This poster covers the choice of a suitable ballast gas and proposes a single cryogenic cycle solution for the FCC-hh and other uses.

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