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Ultra Low Noise Clock Distribution for Electron-Ion Collider Common Platform

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The Electron-Ion Collider (EIC), to be constructed at Brookhaven National Laboratory (BNL), is a roughly 10 year project to design and construct a facility to collide polarized high energy electron beams with polarized proton and heavy ion beams at center of mass energies from 20 GeV to 140 GeV and luminosity up to 1034 cm-2s-1. The project is a partnership between BNL and the Thomas Jefferson National Accelerator Facility (Jefferson Lab, JLAB). The EIC Common Platform (CP) is an effort to design and implement a flexible, high-performance electronics platform for required Low Level RF (LLRF), Timing, Machine Protection, Instrumentation, Power Supply, and general-purpose Accelerator Controls systems. The EIC CP, like its predecessor, the LLRF Platform used at BNL Collider-Accelerator since 2009, will rely on a common ultra-low-noise 100 MHz system clock for operation. We will be presenting the preliminary design work for clock generation, distribution and clean-up while paying special attention to the most challenging phase noise requirements of the EIC hadron storage ring and crab cavities.

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