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# JLEIC – Jefferson Lab Electron Ion Collider

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The Jefferson Lab Electron Ion Collider (JLEIC) is designed to provide high luminosity and high polarization needed to reach new frontiers in the exploration of nuclear structure. The luminosity, exceeding 1033 cm-1s-1 in a broad range of the center-of-mass energy and maximum luminosity above 1034 cm-1s-1, is achieved by high-rate collisions of short small-emittance low-charge bunches made possible by high-energy electron cooling of the ion beam and synchrotron radiation damping of the electron beam. The design of the JLEIC interaction region aims for ~100% acceptance with the necessary resolution, based on a large 50mrad crossing angle and large apertures of final focusing quadrupoles and forward spectrometer dipoles. The unique figure-8 shape of collider rings easily preserves and manipulates the polarization of light ion species (p, d, 3He). A fully consistent set of parameters have been developed considering the balance of machine performance, required technical development and cost. This talk reports recent progress on the JLEIC accelerator design and R&D aspects including electron and ion complexes, integrated interaction region design, figure-8-ring-based electron and light polarization schemes, RF systems, crab crossing scheme, circulator-ring-based high-energy electron cooling and optimization of single particle non-linear dynamics.

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