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MAX 4U: an upgrade of the MAX IV 3 GeV ring

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The MAX IV 3 GeV storage ring in Lund, Sweden, was the first implementation of a multibend achromat (MBA) lattice fourth-generation light source. Since it started delivery of light in 2016, three succeeding MBA-based rings and variants have come on-line: ESRF-EBS, Sirius and APS-U. Several others are being planned, designed, built or commissioned. All of these capitalize on the MBA concept and expand it to push the brightness and coherence performance even further. In order to continue to offer the Swedish and international scientific communities competitive tools beyond the end of this decade, MAX IV Laboratory launched in 2024 the conceptual design of MAX 4U , an upgrade of its 3 GeV storage ring aiming at an emittance below 100 pmrad. This performance boost is to be achieved through a minimum-interference upgrade in which localized interventions in selected subsystems and components are carefully chosen to provide the maximum performance increase with minimum cost and, equally important, minimum dark time for the MAX IV user community. This contribution describes the accelerator physics and engineering aspects of the MAX 4U conceptual design and presents the latest developments.

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