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Modern Web Technologies in Event Display Creation for High-Energy Physics

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The visualization of experimental data plays a vital role in high-energy physics, enabling intuitive interpretation and analysis of particle collision events. Advancements in web technologies have significantly influenced the development of interactive 3D event displays, improving accessibility and performance. This article examines the implementation of modern tools such as React, Bun, Three.js, and JSRoot in the creation of a web-based event display for the MPD experiment at the NICA collider. These technologies optimize rendering efficiency, enhance data processing, and simplify integration within browser environments, eliminating dependencies on specialized software. The approach presented ensures seamless usability across multiple platforms while maintaining high visualization fidelity. Key principles of event data processing, geometry transformation, and interactive visualization techniques are outlined, demonstrating the impact of modern web development on scientific applications in high-energy physics.

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