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Gravitational Form Factors Through the Application of Novel Computational Techniques

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Direct measurements of gravitational form factors (GFFs) are extremely challenging and nearly impossible due to the weakness of gravitational interactions. However, processes such as deeply virtual Compton scattering (DVCS) offer an effective way to study GFFs indirectly by mimicking graviton tensor interactions. Our work integrates insights from experimental physics, lattice QCD, and computational science to enhance data analysis using theoretical constraints and neural network-based fitting methods. These advancements aim to reduce model dependence and improve the precision of GFF extraction, thereby shedding light on the proton' s mechanical properties.

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