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Amplitudes and perturbative unitarity bounds

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We develop a formalism based on spinor-helicity techniques to generalize the formulation of perturbative unitarity bounds. We discuss unitarity bounds for $N \to M$ (with $N, M \geq 2$) scattering processes, relevant for high-energy future colliders, and spin-2 or higher-spin theories, relevant for effective field theories of gravity, that are not approachable by standard methods. As a byproduct of our analysis, we emphasize the power and complementarity of positivity and perturbative unitarity bounds to constrain the parameter space of effective field theories.

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