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Colour-kinematics duality, double copy, and homotopy algebras

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While colour-kinematics duality and double copy are a well established paradigm at tree level, their loop level generalisation remained for a long time an unsolved problem. Lifting the on-shell, scattering amplitude-based description to an action-based approach, we show that a theory that exhibits tree level colour-kinematics duality can be reformulated in a way such that its loop integrands manifest colour-kinematics duality. After a review of Batalin-Vilkovisky formalism and homotopy algebras, we discuss how these structures emerge in quantum field theory and gravity. We focus then on the application of these sophisticated mathematical tools to colour-kinematics duality and double copy, introducing an adequate notion of colour-kinematics factorisation.

In-person participation

Yes

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