

Hidden Zeros and the Double Copy

Saturday 20 July 2024 09:45 (15 minutes)

Recently, Arkani-Hamed et al. proposed the existence of zeros in scattering amplitudes in certain quantum field theories including the cubic adjoint scalar theory $\text{Tr}(\phi^3)$, the $SU(N)$ non-linear sigma model (NLSM) and Yang-Mills (YM) theory. These hidden zeros are special kinematic points where the amplitude vanishes and factorizes into a product of lower-point amplitudes, similar to factorization near poles. In our work, we show a close connection between the existence of such zeros and color-kinematics duality. In fact, the hidden zeros can be derived from the Bern-Carrasco-Johansson (BCJ) relations. We also show that these zeros extend via the Kawai-Lewellen-Tye (KLT) relations to special Galileon amplitudes and their corrections, evincing that these hidden zeros are also present in permutation-invariant amplitudes.

Alternate track

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Yes

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Session Classification: Formal Theory

Track Classification: 10. Formal Theory