



Contribution ID: 117

Type: **not specified**

New positivity bounds from full crossing symmetry

Positivity bounds are constraints on the Wilson coefficients of an effective field theory that can be extracted from fundamental properties of the S-matrix of the UV theory, notably the dispersion relation. We show that a new set of powerful bounds can be obtained by using the full crossing symmetry. In contradistinction to the previous s-u symmetric bounds, these new bounds can be applied to put upper and lower bounds on Wilson coefficients, and are much more constraining as shown in the lowest orders. These bounds can be applied generic effective field theories. As an example of applications, we show that theories with soft amplitude behaviour such as weakly broken Galileon theories can be excluded from admitting a standard UV completion.

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Session Classification: New Developments in Quantum Field Theory

Track Classification: New Developments in Quantum Field Theory