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Two-sided positivity bounds on effective Higgs interactions

Effective field theories are an efficient framework for parametrising the effects of heavy new physics on low energy observables and have become one of the key pillars of the LHC programme. It has recently been appreciated that large portions of EFT parameter spaces are inconsistent with fundamental principles of S-matrix theory such as analyticity/causality and unitarity, and therefore cannot admit quantum field theoretic UV completions. The allowed parameter space is delimited by so-called positivity bounds, which are now understood to carve out a conical subspace of the Wilson coefficients. I will show how the same principles can lead to upper bounds on the coefficient space, effectively "capping" the positivity cone from above. The determination of the bounds can be cast into a linear programming problem that can be efficiently solved numerically. I will highlight some new results for simple scalar theories before moving on to the Higgs boson in the Standard Model EFT, comparing and contrasting the bounds with existing experimental and theoretical limits.

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