

Copositive geometry of Feynman integrals

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Copositive polynomials —that is, polynomials that are nonnegative on the nonnegative real orthant— are well-studied objects in real algebraic geometry and optimization. We connect these to the geometry of Feynman integrals in physics. The integral is guaranteed to converge if its kinematic parameters lie in the interior of the copositive cone.

In this talk, we will discuss several computational methods for certifying whether a given polynomial lies in the copositive cone. In particular, we show that Pólya's method can always be effectively applied to polynomials arising from Feynman integrals. The talk is based on a recent work with Bernd Sturmfels.