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## **The Minkowski sum of the SOS and SONC cones - an inner approximation of the PSD cone**

Studying convex cones inside the cone of positive semidefinite (PSD) polynomials is an important field of research in real algebraic geometry and polynomial optimization. In this talk, we combine two such well established cones, which are sums of squares (SOS) and sums of nonnegative circuit polynomials (SONC) and consider PSD polynomials, that decompose into a SOS and a SONC part. We call the resulting set the SOSONC cone. For this newly established cone, we present separation results showing that for all nontrivial cases from Hilbert's 1888 Theorem, the SOSONC cone lies properly in between the union of the SOS and SONC cones as well as the PSD cone. Moreover, we address the question how membership to the SOSONC cone can be decided in an efficient way.

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