Title: Sum-of-squares hierarchy for symmetric formulations over Boolean hypercube.

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Abstract: First we preset a method for proving Sum-of-Squares (SoS) lower bounds when the initial problem formulation exhibits a high degree of symmetry. Our main technical theorem allows us to reduce the study of the positive semidefiniteness to the analysis of "well-behaved" univariate polynomial inequalities. We illustrate the technique with few applications.
Next, we introduce a method for proving bounds on the SoS rank based on Boolean Function Analysis and Approximation Theory. We apply our technique to improve upon existing results, thus making progress towards answering several open questions.