Chromatic symmetric functions and change of basis

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Based on joint work with Bruce Sagan

We consider the expansions of Stanley's chromatic symmetric function X_G in different bases to prove new e-positivity results. Specifically, by using the monomial basis as an intermediary, we show that if a term e_μ appears with nonzero coefficient in the elementary symmetric function expansion of X_G, then we get bounds on the clique number and independence number of G. This allows us to prove positivity of certain coefficients for all unit interval graphs. We also prove new formulas by using Schur and power sum expansions and performing a change of basis.

References

[1] B. Sagan and F. Tom, *Chromatic symmetric functions and change of basis*. In preparation.

[2] F. Tom, *A signed e-expansion of the chromatic symmetric function and some new e-positive graphs*. arXiv:2311.08020 (2023).