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The magic number conjecture for the m=2 amplituhedron and Parke-Taylor identities

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The magic number conjecture says that the cardinality of a tiling of the amplituhedron An,k,m is the number of plane partitions which fit inside a k by (n-k-m) by m/2 box.
(This is a generalization of the fact that triangulations of even-dimensional cyclic polytopes have the same size.) I'll explain how we prove the magic number conjecture for the m=2 amplituhedron; we also show that all positroid tilings of the hypersimplex Δk+1,n have the same cardinality. Along the way, we give volume formulas for Parke-Taylor polytopes in terms of circular extensions of cyclic partial orders, and we prove new variants of the classical Parke-Taylor identities. This is joint work with Matteo Parisi, Melissa Sherman-Bennett, and Ran Tessler.

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