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Virtual knots, convolutions and a categorification of the $\mathrm{SO}(2N)$ *Kauffman polynomial*

We present a categorification construction for the $\mathrm{SO}(2N)$ specialization of the Kauffman polynomial and prove its invariance under the first and second Reidemeister moves. The construction follows the Kauffman–Vogel alternating sign formula, which expresses the Kauffman polynomial of a link in terms of polynomials of 4-valent planar graphs. We define the matrix factorization associated to the 4-vertex as a convolution of a chain of two saddle morphisms, relating parallel and virtually crossing pairs of arcs.

This is a joint work with M. Khovanov.