

On a triple-graded (odd) Khovanov homology

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Khovanov homology $\mathcal{H}(L)$ of a link L is a sequence of \mathbb{Z} -graded abelian groups, whose Euler characteristic is the Jones polynomial. In fact these groups are naturally graded by $\frac{1}{2}\mathbb{Z} \times \frac{1}{2}\mathbb{Z}$, but this does not lead to new invariants: $\mathcal{H}^{i,p,q}(L)$ is nontrivial only for $p = q$, half of the original \mathbb{Z} -grading. However, this refined grading adds more structure to the homology, especially its odd variant, which can be used to derive formulas for the homology of composite links, such as split links or connected sums, and to describe its module structure over the homology of the unknot. These results are well-known for the classical Khovanov homology, but they are new for its odd variant.

If time permits, I will apply the results to construct homological operations, whose powers all are non-trivial.