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An equivalence between truncations of categorified quantum groups and Heisenberg categories

We will describe a simple diagrammatic 2-category \mathcal{A} that yields a categorification of the principal realization of the basic representation of \mathfrak{sl}_∞ . The 2-category \mathcal{A} is equivalent to a truncation of the Khovanov—Lauda categorified quantum group and also to a truncation of Khovanov’s Heisenberg 2-category. After describing these results, we will discuss applications to actions of the 2-categories involved, the representation theory of the symmetric group, geometry, and W -algebras.