Extended Hall algebras

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Abstract: Hall algebras play an important role in representation theory and algebraic geometry. The Hall algebra of an exact or a triangulated category captures information about the extensions between objects. It turns out that in some cases twisted and extended Hall algebras of triangulated categories are well-defined even when their non-extended counterparts are not. I will explain how to associate a twisted extended Hall algebra to a triangulated category, when the latter arises as the homotopy category of a hereditary exact model category or as an orbit category of certain kind. I will discuss applications of this constructions to graded quiver varieties and to categorification of modified quantum group.