Perfect moment categories, cocartesian comonads and Joyal duality

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Abstract.
In [2] moment categories were introduced as small categories equipped with an *active/inert factorisation system* subject to two simple axioms. The most prominent examples are Segal's category Γ, Eilenberg's category Δ and Joyal's categories Θ_n. In this talk I will discuss *perfect moment categories* defined by the additional property that the inclusion of the active subcategory admits a left adjoint reflection such that the unit of the adjunction is pointwise inert. This notion relates on one side to a special class of cocartesian comonads, and on the other side to Barwick's perfect operator categories [1]. The latter relationship is actually a *categorical duality* which subsumes as special case Joyal's duality [3] between the n-cellular category Θ_n and the category $\mathbb{D}_n$ of combinatorial n-disks.

References

[1] C. Barwick, *From operator categories to higher operads*, Geom. & Topol. 22 (2018), 1893–1959.

[2] C. Berger, *Moment categories and operads*, Theory Appl. Categ. 38 (2022), 1485–1537.

[3] A. Joyal, *Disks, duality and θ-categories*, preprint (1997).