A geometric approach on composition operators on the bidisc

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Talk given at Seminar on Complex Analysis,
meeting 2438, June 8th 2026

In this talk we will study composition operators acting on the weighted Bergman spaces on the bidisc, i.e. $C_\Phi : A^2_\beta(\mathbb{D}^2) \longrightarrow A^2_\beta(\mathbb{D}^2)$ where Φ is induced by rational inner functions (RIFs) or a RIF and a smooth function (mixed case). Our approach is geometric. Our main result is a uniform criterion for all $\beta \in (-1, 0]$ that can be summarized as follows: Boundedness of the composition operator is equivalent to transversal intersection of the level sets for non-smooth symbols, under the assumption that if any tangential intersection occurs on the singularity it must be of high order. This extends the characterization of Bayart-Kosiński to the non-smooth self maps of the bidisc. To reach our conclusions, we utilize results obtained by Anderson, Bergqvist, Bickel, Cima, and Sola on Clark measures associated to RIFs and Puiseux factorizations.