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On the Equal Hull Problem for Nontrivial Semiconvex Hulls

We define a nontrivial semiconvex hull $qr_\alpha(K)$ of a compact set $K \subset M^{N \times n}$ called the α -rank-one convex quadratic hull and establish the equalities of semiconvex hulls with respect to $qr_\alpha(K)$ by showing that $L_c(K) = qr_\alpha(K)$ if and only if $Q(K) = qr_\alpha(K)$, $0 < \alpha < 1$, where $Q(K)$ and $L_c(K)$ are the quasiconvex convex hull and the closed lamination convex hull of K respectively. We also show that $qr_\alpha(K)$ is a nontrivial semiconvex hull, that is, $qr_\alpha(K) \neq C(K)$ if $R(K) \neq C(K)$.

Keywords: Semiconvex hulls, equal hull properties, nontrivial semiconvex hull, rank-one convex quadratic functions

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