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Geometric constraints on the space of N=2 SCFTs MATTEO LOTITO, PHILIP ARGYRES, YONGCHAO LU, MARIO MARTONE, University of Cincinnati — We present a classification of 4d rank-1 $\mathcal{N} = \in$ Superconformal Field Theories (SCFTs). Our approach is based on the analysis of the low energy properties of such theories, by studying the features of their Coulomb Branches, i.e., their moduli space of vacua. The amount of supersymmetry and the residual gauge symmetry in the low energy description provide enough constraints to keep these theories under control, at the same time they are still rich enough that studying them in detail could give good insight on general properties of QFTs. I will describe the method we use to construct the rank 1 theories. It consists in starting by determining the allowed scale invariant geometries for these Coulomb Branches, subsequently extending the analysis by introducing "deformations" of these geometries. I will comment on the constraints that we impose to determine the allowed set of deformations. Finally I will conclude by providing a classification of these spaces - deformations and their interpretation as SCFTs (or IR-free theories), commenting on the possible extensions and generalizations of our approach.

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