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Geometric constraints on the space of $\mathcal{N} = 2$ SCFTs

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We present a classification of 4d rank 1 $\mathcal{N} = 2$ SCFTs, based on a geometrical analysis of the Coulomb Branches of these theories, i.e., their moduli space of vacua.

Supersymmetry and the residual $U(1)$ gauge symmetry on the Coulomb Branch allow us to determine some constraints on the geometries that can be consistently interpreted as low energy moduli space of a SCFT.

We can have distinct SCFTs corresponding to the same scale invariant geometry but which differ by the set of relevant deformations that are turned on. These in fact correspond to different theories, each with its own flavor structure and matter content transforming in appropriate representations of the flavor group.

We classify all the possible deformations of scale invariant Coulomb Branches that satisfy all the low energy consistency conditions and thus can have a consistent interpretation as moduli space of a SCFT. This can be used in conjuction with other approaches, such as S-duality and the conformal bootstrap to obtain a better global understanding of $\mathcal{N} = 2$ SCFTs.

Oral or Poster Presentation

Oral

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