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Vanishing Chiral Algebras

The chiral algebras of two-dimensional theories with (0,2) supersymmetry are vertex-algebra generalizations of the chiral rings of (2,2) supersymmetric theories, the most famous of which is the quantum cohomology ring. We show that the chiral algebra of a (0,2) supersymmetric sigma model vanishes if the target space is a Kähler manifold with positive first Chern class. This implies that supersymmetry is spontaneously broken, therefore gives a physical proof of the Höhn-Stolz conjecture in the Kähler case. It also provides for string manifolds a refinement of Mori's theorem on rational curves in Fano varieties.

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