

Tensionless Strings Limits in 4d Conformal Manifolds

Tuesday, 25 June 2024 14:30 (15 minutes)

Three distinct infinite distance limits appear in the conformal manifolds of four-dimensional superconformal field theories admitting large N limit. They are distinguished by the CFT Distance Conjecture parameter, controlling the exponential behavior with the distance of the anomalous dimension of higher-spin currents. Borrowing lessons from the moduli spaces of flat space vacua in string theory, we argue that these three limits correspond to three different strings becoming tensionless in AdS. To support this claim, we show that the large N Hagedorn temperature of the CFT in these limits only depends on the CFT Distance Conjecture parameter. Thus, these three limits are physically distinguished by the density of states at high energies. Along the way, we build the first Distance Conjecture convex hull for a CFT and find a remarkable connection to no separation of scales in AdS.

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Session Classification: Parallel session