Contribution ID: **188** Type: **not specified**

No-go theorems for higher-spin charges in AdS_2

Wednesday, 21 May 2025 12:25 (25 minutes)

Higher-spin conserved currents and charges feature prominently in integrable 2d QFTs in flat space. Motivated by the question of integrable field theories in Anti de-Sitter space, we consider the consequences of higher-spin currents for QFTs in AdS2, and find that their effect is much more constraining than in flat space. Specifically, it is impossible to preserve: (a) any higher-spin charges when deforming a massive free field by interactions, or (b) any spin-4 charges when deforming a CFT by a Virasoro primary. Along the way, we explain how higher-spin charges lead to integer spacing in the spectrum of primaries and to constraints on correlation functions. We also comment on consequences for critical long-range statistical models.

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