Séminaire commun

W-symmetries, anomalies and heterotic backgrounds with SU holonomy

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Mardi 10 Décembre 2024 à 14:00

LPENS – L378, 24 Rue Lhomond

Résumé

It has been known that 2-dimensional supersymmetric sigma models admit symmetries generated by covariantly constant forms. For target spaces manifolds M n whose holonomy is included in U(n/2), SU(n/2), Sp(n/4), Sp(n/4) · Sp(1), G2(n = 7) and Spin(7)(n = 8), these symmetries close as a W-algebra. In heterotic sigma models, these symmetries are anomalous due to the presence of chiral worldsheet fermions in the action and must be cancelled to preserve the geometric interpretation of the theory. In this talk, I will consider sigma models with target spaces (10-dimensional) supersymmetric heterotic backgrounds with SU (2) and SU (3) holonomy. I will present the W-algebra generated by the covariantly constant forms of the theory, pointing out that it closes under the inclusion of additional generators which are identified. Requiring the chiral anomalies to satisfy the Wess-Zumino consistency conditions at one-loop in perturbation theory, I will provide their explicit expressions. Finally, I will discuss the cancellation of the anomalies at the same loop level either by adding suitable finite local counterterms in the sigma model effective action or by assuming a plausible quantum correction to the transformations. Based on arXiv :2305.19793 with G. Papadopoulos and E. Perez-Bolanos.