

The Evaluation Map in Field Theory, Sigma-Models and Strings—II

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Abstract. In this paper, we examine specifically the rôle of the evaluation map in sigma-models and strings. We discuss the difference between sigma-models and field theory, as far as anomaly cancellation is concerned. The introduction of the Wess–Zumino terms in different sigma-models is considered. Anomalies in string theory are discussed, with special attention to the conformal anomalies and to the sigma-model anomalies for the imbedded (or immersed) world-sheet of the string. Conformal anomalies in two dimensions are connected to holomorphic and gravitational anomalies. In order to have the cancellation of the sigma-model anomalies of the string, certain topological conditions must be satisfied by the ambient manifold. The rôle of the evaluation map in the calculations of global anomalies is also discussed, both for field theories and for sigma-models. In particular global anomalies are connected with the differential characters of Cheeger and Simons. We show that the absence of global anomalies in sigma-models is guaranteed by the absence of torsion in suitable homology groups of the target space.

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