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

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Abstract. The rôle of the evaluation map in anomaly calculations for field theory, sigma-models and strings is investigated. In this paper, anomalies in field theory (with and without a backgrounds connection), are obtained as pull-backs of suitable forms via evaluation maps. The cohomology of the group of gauge transformations is computed in terms of the cohomology of the base manifold and of the cohomology of the structure group. This allows us to clarify the different "topological significance" of gauge and gravitational anomalies. The relation between "locality" and "universality" is discussed and "local cohomology" is linked to the cohomology of classifying spaces. The problem of combining the locality requirement and the index theorem approach to anomalies is also examined. Anomaly cancellation in field theories derived from superstrings is analyzed and the relevant geometrical constraints are discussed.

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