On the trace anomaly and the energy-momentum conservation of quantum fields at D=2 in classical curved backgrounds

M. Alves msalves@if.ufrj.br J. Barcelos-Neto barcelos@if.ufrj.br Instituto de Física

abstract We study the conformal symmetry and the energy-momentum conservation of scalar field interacting with a curved background at $D = 2$. We avoid to incorporate the metric determinant into the measure of the scalar field to explain the conformal anomaly and the consequent energy-momentum conservation. Contrarily, we split the scalar field in two other fields, in such a way that just one of them can be quantized. We show that the same usual geometric quantities of the anomaly are obtained, which are accompanied by terms containing the new field of the theory.