Quantum Group Symmetries
and Non-Local Currents in 2D QFT

Denis Bernard[1] and André LeClair[2]

[1] Service de Physique Théorique de Saclay, F-91191 Gif-sur-Yvette, France
[2] Newman Laboratory of Nuclear Studies, Cornell University, Ithaca, NY 14853, USA

Abstract. We construct and study the implications of some new non-local conserved currents that exist is a wide variety of massive integrable quantum field theories in 2 dimensions, including the sine-Gordon theory and its generalization to affine Toda theory. These non-local currents provide a non-perturbative formulation of the theories. The symmetry algebras correspond to the quantum affine Kac–Moody algebras. The S-matrices are completely characterized by these symmetries. Formal S-matrices for the imaginary-coupling affine Toda theories are thereby derived. The application of these S-matrices to perturbed coset conformal field theory is studied. Non-local charges generating the finite dimensional Quantum Group in the Liouville theory are briefly presented. The formalism based on non-local charges we describe provides an algernative to the quantum inverse scattering method for solving integrable quantum field theories in 2d.

Table of Contents