



Mathematical Physics

# Noninteraction of waves in two-dimensional conformal field theory

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In higher dimensional quantum field theory, irreducible representations of the Poincare group are associated with particles. Their counterpart in two-dimensional massless models are "waves" introduced by Buchholz. In this paper we show that waves do not interact in two-dimensional Moebius covariant theories and in- and out-asymptotic fields coincide. We identify the set of the collision states of waves with the subspace generated by the chiral components of the Moebius covariant net from the vacuum. It is also shown that Bisognano-Wichmann property, dilation covariance and asymptotic completeness (with respect to waves) imply Moebius symmetry. Under natural assumptions, we observe that the maps which give asymptotic fields in Poincare covariant theory are conditional expectations between appropriate algebras. We show that a two-dimensional massless theory is asymptotically complete and noninteracting if and only if it is a chiral Moebius covariant theory.

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