量子物理学・ナノサイエンス第 242 回セミナー

Applications of anomaly matching to SU(N) spin chains and generalization of Haldane conjecture

講師　：　谷崎 佑弥 氏

理化学研究所 理研 BNL 研究センター

日程　：　10 月 1 日（月）14:00–15:30

場所　：　本館 2 階 239 物理学系輪講室

概　要

We discuss an application of anomaly matching to study the phase structure of SU(N) spin chain. Anomaly matching is a field-theoretic avatar of Lieb-Schultz-Mattis theorem, and gives a useful tool to understand nonperturbative aspects of strongly-coupled systems. Low-energy effective theory of SU(N) anti-ferromagnetic Heisenberg chain of p-box representation is described by $SU(N)/U(1)^{N-1}$ nonlinear sigma model with the specific theta angles, and we show that its phase diagram in terms of theta angles is almost completely determined only by symmetry, anomaly, and global inconsistency. We further show that if we have Z_N lattice translation, the anomaly matching suggests that the low-energy limit is described by $SU(N)_{gcd(N,p)}$ Wess-Zumino-Witten model.

連絡教員　物理学系　西田　祐介（内線 3614）