S-duality beyond supersymmetry: non-supersymmetric CHL strings

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Abstract

I will discuss non-supersymmetric CHL compactifications of heterotic strings with Scherk-Schwarz supersymmetry breaking and reduced gauge group rank. Their perturbative moduli space in eight dimensions splits into four connected components, with distinct spectra, T-duality groups, and gauge symmetry enhancement patterns. These structures can be analyzed using lattice methods, and, for the components admitting a nine-dimensional uplift, in terms of Coxeter polyhedra. I will focus on one component for which we propose an S-dual description: a non-supersymmetric version of type IIB string theory on T^2/Z_2 with one (O7^+)-plane. In this dual frame, part of the spectrum is described by BPS objects in a supersymmetric subsector. I will explain the evidence for this proposal and its implications for dualities beyond the supersymmetric setting.

Keywords: String dualities, nonsupersymmetric strings, CHL compactifications, ScherkSchwarz supersymmetry breaking, heterotic strings, type IIB orientifolds, gauge symmetry enhancement

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