

Weak Landau–Ginzburg models for Fano threefolds and
their properties.

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Abstract

Given a smooth Fano variety, Mirror Symmetry predicts the existence of a so called Landau–Ginzburg model — a pencil, whose symplectic geometry reflects the algebraic geometry of the Fano variety, and viceversa. We discuss this relation for mirror symmetry conjecture of Hodge structure variations that translates this relation to a quantitative level. We discuss (mostly for threefolds) how, given Landau–Ginzburg model, predict some numerical invariants of Fano variety (Gromov–Witten invariants, Hodge numbers, characteristic numbers) and its birational type. We also discuss the relations of particular weak Landau–Ginzburg models with toric degenerations.