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Nota di contenuto	Contents ; Preface ; Part 1 In search of the ""optimal embedding"" of a knot ; Chapter 1 Introduction ; 1.1 Motivational problem ; 1.2 Notations and remarks ; Chapter 2 a-energy functional E(a) ; 2.1 Renormalizations of electrostatic energy of charged knots 2.2 Renormalizations of r-a-modified electrostatic energy Ea 2.3 Asymptotic behavior of r-a energy of polygonal knots ; 2.4 The self-repulsiveness of E(a) ; Chapter 3 On E(2) ; 3.1 Continuity ; 3.2 Behavior of E(2) under ""pull-tight"" ; 3.3 Mobius invariance 3.4 The cosine formula for E(2) 3.5 Existence of E(2) minimizers ; 3.6 Average crossing number and finiteness of knot types ; 3.7 Gradient regularity of E(2) minimizers and criterion of criticality ; 3.8 Unstable E(2)-critical torus knots ; 3.9 Energy associated to a diagram 3.9.1 General framework 3.9.2 ""X-energy"" ; 3.10 Normal projection energies ; 3.11

Generalization to higher dimensions ;
Chapter 4 Lp norm energy with higher index
; 4.1 Definition of (a p)-energy functional for knots eap
; 4.2 Control of knots by Eap (eap)
4.3 Complete system of admissible solid tori and finiteness of knot types 4.4 Existence of Eap minimizers ; 4.5 The circles minimize Eap ; 4.6 Definition of a-energy polynomial for knots ; 4.7 Brylinski's beta function for knots ; 4.8 Other Lp-norm energies
Chapter 5 Numerical experiments

Sommario/riassunto

Energy of knots is a theory that was introduced to create a "canonical configuration" of a knot - a beautiful knot which represents its knot type. This book introduces several kinds of energies, and studies the problem of whether or not there is a "canonical configuration" of a knot in each knot type. It also considers this problems in the context of conformal geometry. The energies presented in the book are defined geometrically. They measure the complexity of embeddings and have applications to physical knotting and unknotting through numerical experiments.
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