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RANDOM DISCRETIZATION OF O'HARA KNOT ENERGY

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Abstract. In this paper, we consider the random discrete approximation of O'Hara energy. O'Hara energy is the energy defined for a knot, and O'Hara energy was introduced for defining the standard shape for each knot class (equivalence class by ambient isotopy) by variational method. If the exponent is taken so that the energy is invariant Möbius transformation, O'Hara energy is called Möbius energy. Although discretization for various Möbius energies has been defined to analyze the shape of the minimizer so far, only Γ-convergence to the original energy has been shown for a conventional discretization. In this study, we are successful to show locally uniform convergence and compactness of discrete energy in a space involving the optimal transport theory, by introducing random discrete approximation of O'Hara energy using random variable and we can show convergence from the minimizer to the minimizer.

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