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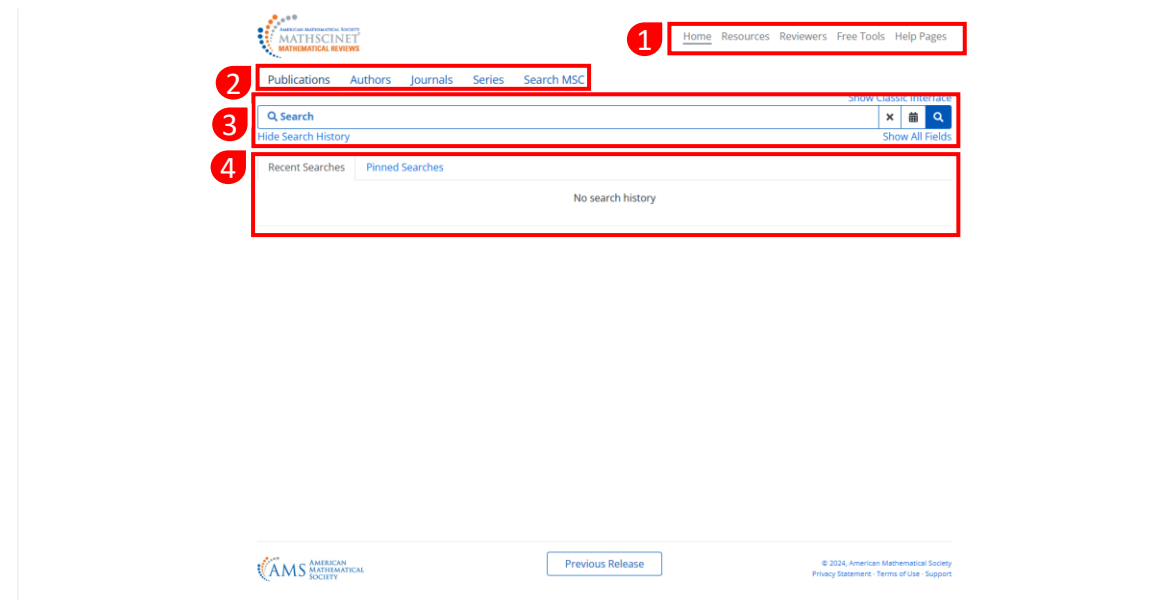
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1. Menu superior
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J. Math. Anal. Appl. **541** (2025), no. 1, Paper No. 128690.

MR4775651 - Time geodesics on a slippery cross slope under gravitational wind Prelim MSC 53 Article
Aldea, Nicoleta; Kopacz, Piotr
Nonlinear Anal. Real World Appl. **81** (2025), Paper No. 104177.

MR4774141 - An inverse Gauss curvature flow to the L_p -Gauss Minkowski problem Prelim MSC 53 Article
Chen, Bin; Shi, Wei; Wang, Weidong
J. Math. Anal. Appl. **541** (2025), no. 1, Paper No. 128656.

MR4767465 - A post-quantum key exchange protocol from the intersection of conics Prelim MSC 94A60 Article
Alzati, Alberto; Di Tullio, Daniele; Gyawali, Manoj; Tortora, Alfonso
J. Symbolic Comput. **126** (2025), Paper No. 102343.

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Hardin, Douglas P. (1-VDB); Saff, Edward B. (1-VDB); Vlasniuk, Oleksandr (1-VDB)
Asymptotics of k -nearest neighbor Riesz energies. (English summary)
 Constr. Approx. **59** (2024), no. 2, 333–383.

Classifications

31C20 - Discrete potential theory
 28A78 - Hausdorff and packing measures
 31B15 - Potentials and capacities, extremal length and related notions in higher dimensions
 52A40 - Inequalities and extremum problems involving convexity in convex geometry

Citations

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Review

Consider a compact set A in $\mathbb{R}^p$, a real-valued function V defined on A , and a non-negative function w defined on $A \times A$. In such a setting, one can take an n -tuple $\omega_n \subseteq A$ and an $s > 0$ and consider the weighted Riesz s -energy of ω_n

$$(1) \quad E_s(\omega_n; w, V) = \sum_{\substack{x, y \in \omega_n \\ x \neq y}} w(x, y) \|x - y\|^{-s} + C \sum_{x \in \omega_n} V(x),$$

where C is a constant (perhaps depending on s , n , and A). The function V plays the role of an external field. In this paper, the authors consider a related quantity, which they call the k -nearest neighbor Riesz s -energy, where $k \in \mathbb{N}$. This is defined using the same formula as (1), but the first sum only considers pairs (x, y) for which y is one of the k nearest neighbors of x .

The new results all include appropriate hypotheses on the set A and the functions w and V . The first such result concerns the asymptotics (as $n \rightarrow \infty$) of configurations ω_n that minimize the k -nearest neighbor Riesz s -energy. In particular, Theorem 1.1 calculates the limiting behavior of this minimum and the asymptotic distribution of points in any minimizing configuration. Another result shows that the asymptotics of the minimum energy for the k -nearest neighbor Riesz s -energy approaches that of the minimum energy for the weighted Riesz s -energy as $k \rightarrow \infty$. Additional results about separation and Γ -convergence are also proven. The final section gives special attention to the special case when A is a circle.

The proofs in the paper use methods of potential theory. The theoretical results are nicely complemented by some numerical illustrations.

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