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Graduate Student Seminar

Monday, 25 September 2023, 12:15-13:00
Seminarraum 05.002, Spiegelgasse 5

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Uniqueness of Radial Solutions of Nonlocal Elliptic Problems via ODE Method

Abstract

Recently, a novel technique[1] has been developed to formulate an infinite system of ODEs that is equivalent to a fractional problem $(-\Delta)^s u = f$, assuming both u and f exhibit radial symmetry. Up until this point, we were unable to apply ODE techniques to investigate nonlocal problems, unlike their classical ($s = 1$) counterparts. However, with this development, we can now employ well-established ODE techniques such as Hamiltonian and Wronskian methods to analyze nonlocal problems featuring radial solutions. In this work, we present a novel proof of the uniqueness of ground states for $(-\Delta u)^s = \lambda u$, which relies on the Wronskian technique.

[1] Weiwei Ao et al. *ODE-methods in non-local equations*. 2020. arXiv: 1910.14512 [math.AP].