

Thursday, October 10th, 17:00-18:00

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BCAM

MAXIMUM PRINCIPLES FOR INTEGRO-DIFFERENTIAL OPERATORS ACTING ON ODD FUNCTIONS

The talk will be devoted to present some maximum principles for integro-differential operators acting on odd functions, as well as their applications regarding a nonlocal version of the Allen-Cahn equation. Our main interest is the so-called saddle-shaped solution to the Allen-Cahn equation in \mathbb{R}^{2m} , a doubly radial solution which is odd with respect to the Simons cone $\{(x', x'') \in \mathbb{R}^m \times \mathbb{R}^m : |x'| = |x''|\}$ and that vanishes only in this set.

The importance of studying this type of solution is due to its relation with the fractional version of a conjecture by De Giorgi and the theory of local and nonlocal minimal surfaces. Saddle-shaped solutions are the simplest non 1D candidates to be global minimizers in high dimensions, a property not yet established in any dimension. The key tool in order to develop a theory on existence and uniqueness of the saddle solution is a maximum principle for odd functions with respect to the Simons cone. The main part of the talk will consist on describing it and its proof.

After this, we will discuss its applications to the theory of existence and uniqueness of the saddle-shaped solution. This is a joint work with Juan Carlos Felipe-Navarro (UPC-BGSMath).