

## **The De Giorgi conjecture for the half-Laplacian in dimension 4**

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The famous the Giorgi conjecture for the Allen-Cahn equation states that global monotone solutions are 1D if the dimension is less than 9. This conjecture is motivated by a deep connection between Allen-Cahn and minimal surfaces, plus classical results about the structure of global minimal graphs. The analogue of this conjecture in half-spaces can be reduced to study the problem in the whole space for the Allen-Cahn equation with the half-Laplacian. In this talk I will present a recent result with A. Figalli where we prove the validity of the De Giorgi conjecture for stable solutions in dimension 3.

As a corollary, we establish the De Giorgi conjecture in dimension 4.