

Rigidity of a non-elliptic differential inclusion related to the Aviles–Giga conjecture

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Abstract

In this talk I will present some recent results on sharp regularity for a differential inclusion into a set $K \subset \mathbb{R}^{2 \times 2}$ that arises in connection with the Aviles–Giga functional. The set K is not elliptic, and in that sense our main result goes beyond Sverak’s regularity theorem on elliptic differential inclusions. In terms of the Aviles–Giga energy, our main result implies that zero energy states coincide (modulo a canonical transformation) with solutions of the differential inclusion into K . This opens new perspectives towards understanding energy concentration properties for Aviles–Giga: quantitative estimates for the stability of zero energy states can now be approached from the point of view of stability estimates for differential inclusions. This is joint work with Xavier Lamy and Andrew Lorent.