

Flat interior singularities for almost-minimizers of area.

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The interior regularity of area-minimizing integral currents and semi-calibrated currents has been studied extensively in recent decades, with sharp dimension estimates and structural results established on their interior singular sets in any dimension and codimension. In stark contrast, the best result in this direction for general almost-minimizing integral currents is that due to Bombieri in the 1980's, which demonstrates that the interior regular set is dense. We provide a construction of two types of examples that demonstrate the sharpness of Bombieri's result, and the dramatic failure of the regularity theory developed for area-minimizing integral currents and semi-calibrated integral currents. The first example is a superposition of $C^{1,\alpha}$ -graphs of a certain type with a flat singular set which can be prescribed to be any closed set with empty interior contained in a $C^{1,\alpha}$ graph. The second example is a two-dimensional almost area-minimizer in R^4 with an accumulation of branching singularities. This is joint work with Max Goering.