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General regularity theorems for absolutely minimal currents have proved to be very difficult to obtain. The codimension 1 case has been treated with success; after previous work by Reifenberg, De Giorgi, Almgren, Miranda, Simons, finally Federer [FH 2] proved the sharp result that absolutely minimal hypersurfaces are non-singular in codimension less than 7. In particular, minimal hypersurfaces of dimension ≤ 6 are analytic manifolds. Also, in the codimension one non-parametric case Bombieri, De Giorgi and Miranda proved regularity in any dimension, a result to be contrasted with the Lipschitz singular cone of Lawson and Osserman.

In general codimensions, the only result was that the set of regular points is dense (Reifenberg, Morrey, Almgren) and only recently Almgren announced [AF 3] that minimal surfaces are regular almost everywhere. It seems likely that Almgren's new methods will in fact show that minimal surfaces are regular in codimension 2; in view of the examples provided by complex analytic varieties, this result would be sharp.

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