

A definition of fractional k -dimensional measure

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I will introduce a fractional notion of k -dimensional measure, with $0 \leq k < n$, that depends on a parameter σ that lies between 0 and 1. When $k = n - 1$ this coincides with the fractional notions of area and perimeter, and when $k = 1$ this coincides with the fractional notion of length. We will see that, when multiplied by the factor $1 - \sigma$, this σ -measure converges to the k -dimensional Hausdorff measure up to a multiplicative constant. I will also outline how we look at the first variation of this measure to consider shape optimization problems. This is based on a joint work with Brian Seguin.

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