1086-VL-1480   **Catherine Mareva Kublik*** (`catkublik@gmail.com`), **Nicolay M Tanushev** and **Richard Tsai**. *An Implicit Interface Boundary Integral Method for Poisson's Equation on Arbitrary Domains.*

We propose a simple formulation for constructing boundary integral methods to solve Poisson's equation on domains with piecewise smooth boundaries defined through their signed distance function. Our formulation is based on averaging a family of parameterizations of an integral equation defined on the boundary of the domain, where the integrations are carried out in the level set framework using an appropriate Jacobian. By the coarea formula, the algorithm operates in the Euclidean space and does not require any explicit parameterization of the boundaries. We present numerical results in two and three dimensions. (Received September 22, 2012)

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