Manifolds with kinks, and asymptotics of the Gaussian operator on them

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Abstract

In this talk, we propose a new type of singular spaces, called manifolds with kinks, that are locally modeled on open subsets of Euclidean spaces with continuous boundaries. We observe that manifolds without and with boundaries and corners all fall into this much larger category, that also include pyramids, right circular cones for example. We then define their tangent spaces and their inward sectors using the (Bouligand) tangent cones studied in nonlinear optimization. We then derive a Taylor expansion of the Gaussian operator on these spaces using the inward sectors. We finish the talk exploring certain pure mathematical and data analysis questions that may be pertinent.