Sampler algorithm for non-convex inverse problem

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Non-convex and multimodal distributions arise in inverse problems with non-linear forward models. Classical MCMC methods generally fail to explore efficiently these distributions and chains get stuck in local minima. Most of the dedicated methods from the literature require running parallel chains or a prior identification of the local minima.

We define a simpler general sampler based on the mixture of a MALA-like kernel dedicated to local moves, and an MTM-like kernel to improve global exploration. It is particularly relevant when the posterior is cheap to evaluate. We apply this sampler to solve a challenging inverse problem from millimeter astronomy.