

# DETERMINISTIC POISSON THINNING ON FINITE AND INFINITE VOLUMES

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Given a homogeneous Poisson point process it is well known that selecting each point independently with some fixed probability gives a homogeneous Poisson process of lower intensity. This is often referred to as *thinning*. Can thinning be achieved without additional randomization; that is, is it possible to choose a subset of the Poisson points as a deterministic function of the Poisson process so that the chosen points form a Poisson process of any given lower intensity?

On an infinite volume, it is always possible. Furthermore, on  $\mathbb{R}^d$ , it is possible to define the deterministic function to be a translation-equivariant factor (that is, if a translation is applied to the original process, the chosen points are translated by the same vector). On a finite volume, the answer depends on both the intensities of the original and resulting Poisson processes. We will discuss joint work with Omer Angel, Alexander Holroyd, and Russell Lyons.