Discrete sets, discrete measures, quasicrystals Fourier, pure crystals

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Let μ be a measure in $\mathbb{R}^d$ which is a tempered distribution, let $\hat{\mu}$ be its Fourier transform, in a general case it is a tempered distribution. If μ and $\hat{\mu}$ are measures with closed discrete supports, then μ is called Fourier quasicrystal. For example let $\mu = \sum_{k\in\mathbb{Z}^d} \delta(x-n)$, where δ is Dirac's measure. By Poisson's formula, we get $\hat{\mu} = \mu$. If the support of μ is a finite union of translates of a single full-rang lattice, then μ is called a pure crystal. If the support of μ is a finite union of translates of several full-rang lattices, then μ is called a comb.

In our talk we show some well-known and new results when Fourier quasicrystal is a pure crystal or a comb. Some of these results we expand to the class of tempered distributions.