

The Gelfand space of the measure algebra

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In this talk I would like to present some recent results concerning the Banach algebra $M(\mathbb{T})$ of Borel regular measures on the circle group with the convolution product. Since it is well-known that the spectrum of a measure can be much bigger than the closure of the values of its Fourier-Stieltjes transform (the Wiener-Pitt phenomenon) it is natural to ask what kind of topological properties of the Gelfand space $\mathfrak{M}(M(\mathbb{T}))$ are responsible for this unusual spectral behaviour. It follows immediately from the existence of the Wiener-Pitt phenomenon that the set \mathbb{Z} identified with Fourier-Stieltjes coefficients is not dense in $\mathfrak{M}(M(\mathbb{T}))$. However, it is not clear if any other countable dense subset of this space exists. During my talk, I will disprove this fact - i.e. I will show the non-separability of the Gelfand space of the measure algebra on the circle group. This result is contained in a paper 'On topological properties of the measure algebra on the circle group' written in a collaboration with Michał Wojciechowski which has not been published yet but is available on [arxiv.org](https://arxiv.org/abs/1603.05864) with identifier: 1603.05864.