The Beurling and Malliavin Multiplier Theorem revisited.

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The present talk will be mostly is devoted to a new multidimensional generalization of the Beurling and Malliavin Multiplier Theorem. In more detail, we shall see how to obtain a new sufficient condition for a radial function to be a Beurling and Malliavin Majorant in several dimensions (this means that the function in question can be minorized by the modulus of a nonzero square integrable function which has the support of the Fourier transform included in an arbitrary small ball). We shall also explain how to deduce from here a new sharp sufficient condition in the nonradial case. The latter result provides a partial answer to a question posed by L. Hörmander. If the time permits, then we shall also discuss some connected one dimensional results.

The talk will be mostly based on the results of the paper [3] and, if the time permits, then also on those of papers [1] and [2].

[1] I. Vasilyev, *On the multidimensional Nazarov lemma*, Proceedings of American Mathematical Society, 11 p., (2022) (DOI: https://doi.org/10.1090/proc/15805).

[2] I. Vasilyev, *A generalization of the First Beurling–Malliavin theorem*, (2022), 16 p., to appear in Analysis and PDE, link to arxiv: https://arxiv.org/pdf/2109.04123.pdf, https://msp.org/soon/coming.php?jpath=apde

[3] I. Vasilyev, *The Beurling and Malliavin Theorem in Several Dimensions*, link to arxiv: https://arxiv.org/pdf/2306.12397.pdf