

MAXIMAL OPERATOR OF THE CLASSICAL MULTI-DIMENSIONAL LAGUERRE SEMIGROUP

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ABSTRACT

The aim of this talk is to present a new proof of weak type $(1, 1)$ estimate for the maximal operator based on the heat semigroup in the multi-dimensional Laguerre polynomial setting. In the one-dimensional case this was proved by Muckenhoupt (TAMS, '69) by a rather elementary analysis. Then, in the multi-dimensional situation it was first shown by Dinger (Rev. Mat. Ibero., '92) and more recently by Sasso (Math. Scand., '05) with some restriction on a type parameter appearing in this context. However, these proofs are lengthy and very technical.

Our method of proving the weak type $(1, 1)$ estimate is inspired by the strategy implemented by García-Cuerva, Mauceri, Meda, Sjögren and Torrea (J. London Math. Soc., '03) in the Hermite (Ornstein-Uhlenbeck) context, which is actually strongly connected with a special case of the Laguerre situation. This approach seems to be much simpler and more transparent compared with the above mentioned earlier proofs existing in the literature.

The talk is based on a joint work with Adam Nowak and Peter Sjögren.

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