Boğaziçi
MATH COLLOQUIUM

Singular Integral Operators by Means of Stable Processes and their Connection to Fractional Derivatives

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Abstract: Probability Theory presents tools to study singular integral operators and analitically difficult problems by means of stochastic processes. One such problem is to determine a general class of multipliers and so the bounded operators on function spaces. In this talk we will use a discontinuous process, namely a product of a symmetric stable process and Brownian motion, to show boundedness results of extended versions of classical singular integral operators. We will define Littlewood-Paley operators arising from this process and discuss the corresponding multipliers which are studied in [2]. We will introduce versions of intermediate operators appearing in the Littlewood-Paley Theory and show our recent results in [1]. Finally we will discuss the relation between these new operators and fractional derivative in its integral form.

References

[1] Karli, D. *An Extension of a Boundedness Result for Singular Integral Operators*, Colloquium Mathematicum, **145**, Issue 1, (2016) , 15-33.

[2] Karli, D. *A Multiplier Related to Symmetric Stable Process*, Hacettepe Journal of Mathematics and Statistics, **46**, Issue 2, (2017), 217-228.

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