

# İSTANBUL ANALYSIS SEMINARS

## FUNCTIONS OF NONCOMMUTING OPERATORS

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**Abstract:** Let  $A$  and  $B$  be not necessarily commuting self-adjoint operators. We define functions  $f(A, B)$  for a certain class of functions  $f$  with the help of double operator integrals. We are interested in the problem when we have Lipschitz-type estimates in different norms. We obtain the following Lipschitz norm estimate in the trace norm:

$$\|f(A_1, B_1) - f(A_2, B_2)\|_{S_1} \leq \text{const} \max\{\|A_1 - A_2\|_{S_1}, \|B_1 - B_2\|_{S_1}\}$$

for functions  $f$  on the plane that belong to the Besov space  $B_{\infty,1}^1$ .

On the other hand, unlike in the case of commuting operators, for functions in the Besov space  $B_{\infty,1}^1$  there is no Lipschitz type estimates in the operator norm. The main tool is triple operator integrals.

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