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WEAKLY CHAOTIC ORDER AND ITS APPLICATION TO CLASS A OPERATORS

Takeaki Yamazaki

Department of Mathematics, Kanagawa University, Yokohama 221-8686, Japan
E-mail: yamazt26@kanagawa-u.ac.jp

and

Masahiro Yanagida
Department of Applied Mathematics, Faculty of Science,
Science University of Tokyo, Tokyo 162-8601, Japan
E-mail: yanagida@rs.kagu.tus.ac.jp

In this talk, we shall introduce the following researches:

(1) On the polar decomposition of the products of operators.
(2) Relations between weakly chaotic order inequalities and their extensions.
(3) An application of (1) and (2) to class A operators.

In (1), we shall introduce the polar decomposition of ST by using the polar decompositions of S and T. Then, we shall introduce an equivalence condition for $|S||T^*| = |T^*||S|$. In (2), we shall introduce two relations between the following inequalities

$$(B^{\frac{r}{2}}A^pB^{\frac{r}{2}})^{\frac{r}{p+r}} \geq B^r \quad and \quad A^p \geq (A^{\frac{p}{2}}B^rA^{\frac{p}{2}})^{\frac{p}{p+r}}$$

for positive operators A, B and $p, r > 0$, which are weaker than the chaotic order ($logA \geq logB$). Then we shall extend this result to more general inequalities, and we can obtain an application to paranormal operators. In (3), we shall introduce an application of these results on an operator transformation from class A to the class of hyponormal operators.

Part of these researches are joint works with Professor Muneo Cho and Doctor Masatoshi Ito.