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ISOLATED POINTS OF SPECTRUM OF (p,k)-QUASIHYPONORMAL OPERATORS

Kôtarô Tanahashi
Department of Mathematics, Tohoku College of Phamacy, Sendai 981-8558, Japan
E-mail: tanahasi@tohoku-pharm.ac.jp ,

Atsushi Uchiyama
Mathematical Institute, Tohoku University, Sendai 980-8578, Japan
E-mail: uchiyama@math.tohoku.ac.jp

and

Muneo Cho
Department of Mathematics, Kanagawa University, Yokohama 221-8686, Japan
E-mail: chiyom01@kanagawa-u.ac.jp

In 2003 Kotac, In Hyoun Kim [2] introduced a (p,k)-quasihyponormal operator T on a complex Hilbert space $\mathcal{H}$, i.e.,

$$T^{*k}((T^*T)^p - (TT^*)^p)T^k \geq 0$$

for a positive number $0 < p \leq 1$ and a positive integer k. This class is a generalization of p-hyponormal, p-quasihyponormal, k-quasihyponormal operators, and In Hyoun Kim proved Putnam's inequality and Weyl's theorem for (p,k)-quasihyponormal operators.

Let $T \in B(\mathcal{H})$ and λ_0 an isolated point of $\sigma(T)$. Then there exists a positive number $r > 0$ such that $\{\lambda \in \mathbb{C} \ : \ |\lambda - \lambda_0| \leq r\} \cap \sigma(T) = \{\lambda_0\}$. Let

$$E = \frac{1}{2\pi i} \int_{|\lambda - \lambda_0| = r} (\lambda - T)^{-1} d\lambda.$$

E is called the Riesz idempotent for λ_0, and E satisfies $E^2 = E, ET = TE, \sigma(T|E\mathcal{H}) = \{\lambda_0\}$ and $\ker((T-\lambda_0)^n) \subset E\mathcal{H}$ for all positive integers n.

In this talk we investigate properties of Riesz idempotent E for a (p,k)-quasihyponormal operator T. The results are the following.

(1) If $\lambda_0 \neq 0$, then E is self-adjoint and

$$E\mathcal{H} = \ker(T - \lambda_0) = \ker((T - \lambda_0)^*).$$

(2) If $\lambda_0 = 0$, then $E\mathcal{H} = \ker(T^k)$.

Reference

[1] M. Cho and K. Tanahashi, *Isolated point of spectrum of p-hyponormal, log-hyponormal operators,* Integral Equations and Operator Theory, **43**(2002), 379-384.
[2] In Hyoun Kim, *On (p, k)-quasihyponormal operators,* preprint.
[3] K. Tanahashi and A. Uchiyama, *Isolated point of spectrum of p-quasihyponormal operators*, Linear Algebra and its Applications, **341**(2002), 345–350.