CLASS p-$wA(s,t)$ OPERATORS AND RANGE KERNEL ORTHOGONALITY

T. PRASAD, M. CHŌ, M.H.M RASHID, K. TANAHASHI AND A. UCHIYAMA

Received March 27, 2017; revised June 19, 2017

Abstract. Let $T = U|T|$ be a polar decomposition of a bounded linear operator T on a complex Hilbert space with $\ker U = \ker |T|$. T is said to be class p-$wA(s,t)$ if $\left(|T^*|^t|T|^{2s}|T^*|^t\right)^{\frac{tp}{s+t}} \geq |T^*|^{2tp}$ and $|T|^{2sp} \geq \left(|T|^s|T^*|^{2t}|T|^s\right)^{\frac{sp}{s+t}}$ with $0 < p \leq 1$ and $0 < s, t, s+t \leq 1$. This is a generalization of p-hyponormal or class A operators. In this paper we prove following assertions. (i) If T is class p-$wA(s,t)$, then T is normaloid and isoloid. (ii) If T is class p-$wA(s,t)$ and $\sigma(T) = \{\lambda\}$, then $T = \lambda$. (iii) If T is class p-$wA(s,t)$, then T is finite and the range of generalized derivation $\delta_T : B(\mathcal{H}) \ni X \to TX - XT \in B(\mathcal{H})$ is orthogonal to its kernel. (iv) If S is class p-$wA(s,t), T^*$ is an invertible p-$wA(t,s)$ operator and X is a Hilbert-Schmidt operator such that $SX = XT$, then $S^*X = XT^*$.

Key words and phrases. class p-$wA(s,t)$, normaloid, isoloid, finite, orthogonality.