

TRACE FORMULAE ASSOCIATED WITH THE POLAR DECOMPOSITION
OF OPERATORS

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ABSTRACT

Let $T = X + iY$ be the Cartesian decomposition of an invertible operator T on a Hilbert space with trace class self-commutator $[T^*, T]$. Carey–Pincus introduced the principal function g and proved a trace formula associated with the Cartesian decomposition $T = X + iY$. Applying the ordered C^∞ -functional calculus for (X, Y) to their trace formula, we define the principal function g^P and prove a trace formula associated with the polar decomposition $T = U|T|$. Using this formula, we show that $g(x, y) = g^P(e^{i\theta}, r)$ almost everywhere $x + iy = re^{i\theta}$ on \mathbf{C} .