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## Characterization of Non Linear Maps Commuting with the Mean Transform under usual Product

### Communication Info

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- (1) Non linear preservers.
- (2) Mean transform
- (3) Hilbert spaces.
- (3) Spectrum
- (3) Orthogonal projections.

### Abstract

Let  $B(H)$  denote the algebra of all bounded linear operators acting on a complex Hilbert space  $H$  with  $\dim H \geq 2$ . For each  $T \in B(H)$ , there exists a unique partial isometry  $V \in B(H)$  such that  $T = V|T|$  and  $\ker(V) = \ker(T)$ , where  $|T| = (T^*T)^{1/2}$ .

The mean transform of  $T$  is defined by  $M(T) = 1/2 (V|T| + |T|V)$ , where  $T = V|T|$  is the polar decomposition of  $T$ .

Let  $\varphi : B(H) \rightarrow B(K)$  be a bijective map. We say that  $\varphi$  commutes with the mean transform for the usual product if  $M(\varphi(A)\varphi(B)) = \varphi(M(AB))$  for all  $A, B \in B(H)$ .

In this work, we present a complete characterization of all bijective maps  $\varphi$  satisfying this property.

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