

An Uhlhorn-type generalisation of Wigner's unitary-antiunitary theorem

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Let H be a Hilbert space and $P(H)$ be the projective space of all quantum pure states. Wigner's theorem states that every bijection $\phi: P(H) \rightarrow P(H)$ that preserves the quantum angle between pure states is automatically induced by either a unitary or an antiunitary operator $U: H \rightarrow H$. Uhlhorn's theorem generalises this result for bijective maps ϕ that are only assumed to preserve the quantum angle $\frac{\pi}{2}$ (orthogonality) in both directions. In this talk we consider the corresponding structural problem for bijections that preserve only one fixed quantum angle α in both directions, $0 < \alpha < \frac{\pi}{2}$.

Partly joined work with Michiya Mori (University of Tokyo)

References:

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