

## On covariant maps of matrices

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The classes of maps in the space of hermitian matrices that commute with the action of the unitary group by conjugation are considered. Such maps we call covariant maps.

The most popular examples of covariant maps come from the functional calculus. Namely if  $\phi$  is a Borel function then the map  $T \rightarrow \phi(T)$  is clearly covariant. We describe all covariant maps and explore their analytic properties (in particular, we find conditions under which these maps are continuous, Lipschitz or differentiable).

We consider also the maps in the matrix space that commute with the action of the general linear group by conjugation. Some applications to functional calculus are obtained.