Title: Maps on M_n preserving Lie products

Author(s): Gregor Dolinar

Let M_n be the Lie algebra of all $n \times n$ complex matrices with the Lie product $[A, B] = AB - BA$ and let $\phi : M_n \to M_n$ satisfy $\phi([A, B]) = [\phi(A), \phi(B)]$, $A, B \in M_n$. Then $\phi(M_n)$ is a commutative subset of M_n or there exist an invertible matrix $T \in M_n$, a function $\varphi : M_n \to \mathbb{C}$ satisfying $\varphi(C) = 0$ for every trace zero matrix $C \in M_n$, and a homomorphism f of the complex field, such that $\phi([a_{ij}]) = T[f(a_{ij})]T^{-1} + \varphi([a_{ij}])I$ for all $[a_{ij}] \in M_n$, or $\phi([a_{ij}]) = -T[f(a_{ij})]^t T^{-1} + \varphi([a_{ij}])I$ for all $[a_{ij}] \in M_n$.

Address:
Gregor Dolinar
Faculty of Electrical Engineering
University of Ljubljana
Tržaška 25
SI-1000, Ljubljana
Slovenia