Commuting graph of $B(H)$

Bojan Kuzma

[(1)]University of Primorska, Slovenia, and [(2)] Institute of Mathematics, Physics, and Mechanics, Slovenia.

Abstract

A commuting graph of an algebra $\mathcal{A}$ is a simple graph whose vertices are all noncentral elements of $\mathcal{A}$, and where two vertices are connected if they are disjoint and the corresponding elements commute in $\mathcal{A}$. Although originally used as a step towards classification of finite simple groups, the commuting graph is recently being studied on various algebraic structures like matrix algebras, semigroups, matrices over semirings,.... We will investigate its connectedness and diameter for the algebra of bounded operators on complex Hilbert space. In particular it turns out that for separable Hilbert spaces, there exists an operator T such that $X' = T'$ for every nonscalar operator $X \in T'$, the commutant of T.

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