

On semitransitivity

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We say that a collection C of complex $n \times n$ matrices is semitransitive, or, more precisely, acts semitransitively on the underlying n -dimensional vector space V , if for every pair of nonzero vectors x, y in V there is an element A of C such that either $Ax = y$ or $Ay = x$. The notion coincides with the notion of transitivity for groups of matrices, but not in general. Topological version of the notion can be defined in the obvious way. Semitransitivity was introduced in 2005 by H. Rosenthal and V. Troitsky who first studied it in the context of WOT-closed algebras of Hilbert space operators. It was later studied in finite and infinite dimensional settings by many authors - including a working group at LAW. A good deal of results were obtained, sometimes in line with initial conjectures but quite often not.

This will be a survey talk of some interesting results and tools used in the area. I will also discuss recent work, joint with J. Bernik, in which we relate the notion of semitransitivity to the study of prehomogeneous vector spaces.