# FINITE GROUPS WITH SUBMULTIPLICATIVE SPECTRUM

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We report on recent joint work with L. Grunenfelder, T. Koair, and H. Radjavi. Submultiplicative spectrum is a typical property of matrix groups (or semigroups as a matter of fact). It means that the product of any two of them has the spectrum contained in the product of the two spectra. (We need the underlying field to be algebraically closed for that definition.) Here, we study abstract groups related to this condition. Actually, abstract finite groups with the property, that all of their subrepresentations have submultiplicative spectrum, are called groups with property s-hat. Such groups are necessarily nilpotent and we focus on p-groups. p-groups with property s-hat are regular. Hence, a 2-group has property s-hat if and only if it is commutative. For an odd prime p, all p-abelian groups have property s-hat, in particular all groups of exponent p have it. We show that a 3-group or a metabelian p-group (with p no smaller than 5) has property s-hat if and only if it is V-regular. This way we give a new point of view on the notion of regularity of abstract p-groups, we give a new formulation of a long open problem and give solutions of some special cases of it.