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Forcing the appearance of Galois groups: new automatic realization results for p -groups.

One of the outstanding problems in Galois theory is to determine conditions on a group G and field F that explicitly determine whether G appears as the Galois group of some extension E/F . One can also ask relative versions of this same question, such as whether the appearance of one group G_1 as a Galois group over F forces the appearance of another group G_2 as a Galois group over F . In such a case, we say that G_1 automatically realizes G_2 . In this talk we'll give some new automatic realization results when G_1 and G_2 are extensions of $\mathbb{Z}/p^n\mathbb{Z}$ by elementary p -abelian groups. One can also ask for the minimum number of times a group G can appear as a Galois group over F , provided that it appears at least once; this is the so-called realization multiplicity of F . In this talk we'll also discuss some new results which describe several groups with large realization multiplicity. (Received September 18, 2009)