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Classification of group subschemes in GL_n, that contain a split maximal torus. (Russian, English) Zbl 1110.14040

Zap. Nauchn. Semin. POMI 321, 281-296 (2005); translation in J. Math. Sci., New York 136, No. 3, 3988-3995 (2006).

From the text: We describe group subschemes of GL_n over an arbitrary field that contain a split maximal torus. The main results are:

Theorem. There is a canonical bijection between the set of all connected group subschemes of GL_{l+1} containing a split maximal torus and the set of functions $\phi : A_l \to \mathbb{N} \cup \{0, \infty\}$ satisfying the property $\phi(\alpha+\beta) \geq \min(\phi(\alpha), \phi(\beta))$ for the root system A_l.

Theorem. There is a canonical bijection between the set of all group subschemes of GL_{l+1} containing a split maximal torus and the set of pairs (W, ϕ), where ϕ is a function $\phi : A_l \to \mathbb{N} \cup \{0, \infty\}$ satisfying the property $\phi(\alpha+\beta) \geq \min(\phi(\alpha), \phi(\beta))$, and W is a certain subgroup of the Weyl group $W(A_l)$ containing all the reflections w_α for $\alpha \in A_l$ such that $\phi(\alpha) = \phi(-\alpha) = \infty$ and normalizing the function ϕ.

This is a joint generalization of the papers by *Z. I. Borevich, N. A. Vavilov* [Tr. Mat. Inst. Steklova 148, 43–57 (1978; Zbl 0444.20039)] and others on the description of overgroups of a maximal torus and the works by *Ch. Wenzel* [Proc. Am. Math. Soc. 117, No. 4, 899–904 (1993; Zbl 0785.20023)] on parabolic subschemes.

MSC:

14L15 Group schemes
20G15 Linear algebraic groups over arbitrary fields

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