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Sous-Groupes Elliptiques de Groupes Linéaires sur un Corps Valué

Let n be a positive integer and \mathbb{F} be a valuated field. We prove the following result: Let Γ be a subgroup of $\mathrm{GL}_n(\mathbb{F})$ generated by a bounded subset, such that every element of Γ belongs to a bounded subgroup. Then Γ is bounded. This implies the following. Let G be a connected reductive group over \mathbb{F} . Suppose that \mathbb{F} is henselian (e.g. complete) and either that G is almost split over \mathbb{F} , or that the valuation of \mathbb{F} is discrete and \mathbb{F} has perfect (e.g. finite) residue class field. Let Δ be its (extended) Bruhat-Tits building. Let x_0 be any point in Δ and $\overline{\Delta}$ be the completion of Δ . Let Γ be a subgroup of G generated by S with $S.x_0$ bounded, such that every element of Γ fixes a point in $\overline{\Delta}$, then Γ has a global fixed point in $\overline{\Delta}$.