**THESIS INFORMATION**

Thesis title: Maximal subgroups of skew linear groups.

Speciality: Algebra & Number theory.

Code: 62460104.

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1. SUMMARY:

This thesis is written with the intention of providing a study of maximal subgroups of a skew linear group. Our attention will focus on maximal subgroups in skew linear groups of very special type, namely, almost subnormal subgroups. The main subjects of this thesis are the maximal subgroups such subgroups of some special types, most notably maximal subgroups containing non-abelian free subgroups, solvable-by-finite maximal subgroups, and locally solvable maximal subgroups.

2. NOVELTY OF THESIS:

The main results obtained in thesis can be summarized as follows:

1. The results relating to maximal subgroups that contain a non-abelian free subgroup:

 *Let* $D$ *be a non-commutative locally finite division ring with center* $F$ *and* $G$ *an almost subnormal subgroup of* $GL\_{n}\left(D\right)$ *with* $n\geq 1$*. Assume that* $M$ *is a non-abelian maximal subgroup of* $G.$ *If* $M$ *contains no non-cyclic free subgroups, then* $\left[D:F\right]<\infty $ *there exists a subfield* $K$ *of* $M\_{n}\left(D\right)$ *such that* $K/F$ *is a Galois extension,* $G∩N\_{GL\_{n}\left(D\right)}\left(K^{\*}\right)=M, K^{\*}∩G⊴M, M/K^{\*}∩G≅Gal\left(K/F\right)$ *is a finite simple group, and* $K^{\*}∩G$ *is the Fitting subgroup of* $M$ *and* $F\left[M\right]= M\_{n}\left(D\right)$*.*

1. The results relating to solable-by-finite maximal subgroups:

*Let* $D$ *be a non-commutative division ring with center* $F$ *and* $G$ *an almost subnormal subgroup of* $GL\_{n}\left(D\right)$ *with* $n\geq 1$*. Assume that* $M$ *is a non-abelian maximal subgroup of* $G$*. If* $M$ *is solvable-by-finite, then* $\left[D:F\right]<\infty $ *and* $F\left[M\right]= M\_{n}\left(D\right)$*, there exists a subfield* $K$ *of* $M\_{n}\left(D\right)$ *such that* $K/F$ *is a Galois extension,* $K^{\*}∩G$ *is the Fitting subgroup of* $M$*,* $G∩N\_{GL\_{n}\left(D\right)}\left(K^{\*}\right)=M, M/K^{\*}∩G≅Gal\left(K/F\right)$ *is a finite simple group of order* $n\sqrt{\left[D:F\right]}$*.*

1. The results relating to locally solvable maximal subgroups:

*Let* $D$ *be a non-commutative division ring with center* $F$ *and* $G$ *an almost subnormal subgroup of* $GL\_{n}\left(D\right)$ *with* $n\geq 1$*. If* $G$ *contains a non-abelian locally solvable maximal subgroup* $M,$ *then* $n=1$ *and the following assertions hold:*

$\left(1\right)$ *There exists a subfield* $K$ *of* $M\_{n}\left(D\right)$ *such that* $K/F$ *is a Galois extension with*

$M/K^{\*}∩G≅Gal\left(K/F\right)≅Z\_{p}$ *and* $\left[D:F\right]=p^{2},$ *where* $p$ *is a prime number.*

$\left(2\right)$$K^{\*}∩G$ *is FC-center and the Hirsch-Plotkin radical of* $M$*. For each* $x\in M\K$*, we have* $x^{p}\in F$ *and* $D=⨁\_{i=1}^{p}Kx^{i}$*.*

3. APPLICATIONS/ APPLICABILITY/ PERSPECTIVE

The new results obtained in this thesis provide several interesting possibilities for future work. For example,

1. The existence of maximal subgroups of the multiplicative group of a non-commutative division ring.
2. The existence of abelian maximal subgroups of linear groups and skew linear groups.

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