As shown in [3] the set $S^\sigma_n$ of all $n$-multiply $\sigma$-local formations forms a complete algebraic modular lattice.

**Theorem 1.** The lattice $S^\sigma_n$ of all $n$-multiply $\sigma$-local formations is a complete sublattice of the lattice of all $n$-multiply saturated formations.

In the case when $n = 1$, we get from Theorem 1 the following result.

**Corollary 1.** The lattice $S^\sigma$ of all $\sigma$-local formations is a complete sublattice of the lattice of all saturated formations.

References

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Elementary reduction of idempotent matrices over semiabelian rings

**Andrii Sahan**

A ring $R$ is a associative ring with nonzero identity. An elementary $n \times n$ matrix with entries from $R$ is a square $n \times n$ matrix of one of the types below:
1) diagonal matrix with invertible diagonal entries;
2) identity matrix with one additional non diagonal nonzero entry;
3) permutation matrix, i.e. result of switching some columns or rows in the identity matrix.

A ring $R$ is called a ring with elementary reduction of matrices in case of an arbitrary matrix over $R$ possesses elementary reduction, i.e.for an arbitrary matrix $A$ over the ring $R$ there exist such elementary matrices over $R$, $P_1, \ldots, P_k, Q_1, \ldots, Q_s$ of respectful size that

$$P_1 \cdots P_k \cdot A \cdot Q_1 \cdots Q_s = \text{diag}(\varepsilon_1, \ldots, \varepsilon_r, 0, \ldots, 0),$$

where $R\varepsilon_i+1R \subseteq R\varepsilon_i \cap \varepsilon_iR$ for any $i = 1, \ldots, r - 1$. 
A ring $R$ is called $EID$-ring in case of an indempotent matrix over $R$ possesses elementary-idempotent reduction, i.e. for an indempotent matrix $A$ over the ring $R$ there exist such elementary matrices over $R$, $U_1, \ldots, U_l$ of respectful size that

$$U_1 \cdots U_l \cdot A \cdot (U_1 \cdots U_l)^{-1} = \text{diag}(d_1, d_2, \ldots, d_r, 0, \ldots, 0),$$

where $l, r \in \mathbb{N}$.

An idempotent $e$ in a ring $R$ is called right (left) semicentral if for every $x \in R$, $ex = exe$ ($xe = exe$). And the set of right (left) semicentral idempotents of $R$ is denoted by $S_r(R)$ ($S_l(R)$).

We define a ring $R$ semiabelian if $Id(R) = S_r(R) \cup S_l(R)$.

All other necessary definitions and facts can be found in [1, 2, 3].

**Theorem 1.** Let $R$ be an semiabelian ring and $A$ be an $n \times n$ idempotent matrix over $R$. If there exist elementary matrices $P_1, \ldots, P_k$ and $Q_1, \ldots, Q_s$ such that $P_1 \cdots P_k \cdot A \cdot Q_1 \cdots Q_s$ is a diagonal matrix, then there is elementary matrices $U_1, \ldots, U_l$ such that $U_1 \cdots U_l \cdot A \cdot (U_1 \cdots U_l)^{-1}$ is diagonal matrix.

**Theorem 2.** Let $R$ be an semiabelian ring. Then a ring with elementary reduction of matrices is an $EID$-ring.

**Theorem 3.** The following are equivalent for a semiabelian ring $R$:

(a) Each idempotent matrix over $R$ is diagonalizable under a elementary transformation.

(b) Each idempotent matrix over $R$ has a charateristic vector.

**Theorem 4.** Let $R$ be an semiabelian ring, $N$ be the set of nilpotents in $R$, and $I$ be an ideal in $R$ with $I \subseteq N$. Then $R/I$ is an $EID$-ring, if and only if $R$ is an $EID$-ring.

**References**


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Higher power moments of the Riesz mean error term of hybrid symmetric square L-function

OLGA SAVASTRU

Let $f(z) = \sum_{n=1}^{\infty} a_f(n)e^{2\pi inz}$ be a holomorphic cusp form of even weight $k \geq 12$ for the full modular group $SL(2, \mathbb{Z})$, $z \in \mathbb{H}$, $\mathbb{H} = \{z \in \mathbb{C}|Im(z) > 0\}$ is the upper half plane. We suppose that $f(z)$ is a normalized eigenfunction for the Hecke operators $T(n)(n \geq 1)$ with $a_f(1) = 1$. 