Ikkinchi tip klassik soha avtomorfizmlari va ularning xossalari

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Ikkinchi tip klassik soha: $\Re_2(m,m)$-sohaning har bir elementi ushbu:

$$I^{(m)} - Z\bar{Z} > 0$$

munosabatlarni qanoatlantiruvchi m-tartibli simmetrik kvadrat matritsalardan iborat. Bunda $I^{(m)}$ -m-tartibli birlik kvadrat matritsa, $\bar{Z}$- Z ga qo'shma matritsa.

$\Re_2(m,m)$ ikkinchi tip klassik soha avtomorfizmi quyidagi ko'rinishda bo'ladi:

$$\varphi(Z) = (AZ+B)\left(\bar{B}Z+\bar{A}\right)^{-1}, \tag{1}$$

bu avtomorfizmning koeffitsiyentlari

$$\bar{A}A' - \bar{B}B' = I^{(m)},\ A'B = B'A$$

shartlarni qanoatlantiradi.
Agar $A = R,\ A^{-1}B = -P$ deb belgilab (1) akslantirishni soddalashtirsak quyidagi

$$\varphi(Z) = R(Z-P)(I-P^*Z)^{-1}\bar{R}^{-1}$$

munosabatga ega bo'lamiz.
Ushbu:

$$\varphi_P(Z) = R(Z-P)(I-P^*Z)^{-1}\bar{R}^{-1}$$

akslantirish quyidagi:

$$Z \in \Re_2(m,m), \bar{R}\left(I-\bar{P}P\right)R' = I^{(m)}, RP + P\bar{R} = 0, R = R^*$$

munosabatlar bilan berilgan bo'lsin.

Teorema. $\varphi_P(Z)$ akslantirish uchun quyidagi xossalar o'rinli:
1^0. $\varphi_P(P) = 0,\ \varphi_P(0) = P$;
2^0. $d(\varphi_P(P)) = RdZR', d(\varphi_P(0)) = (R^*)^{-1}dZ\bar{R}^{-1}$;
3^0. Ixtiyoriy $Z, W \in \Re_2(m,m)$ uchun ushbu:

$$\det(I - \langle\varphi_P(Z), \varphi_P(W)\rangle) = \frac{\det(I-\langle P,P^*\rangle)\cdot\det(I-\langle Z,W^*\rangle)}{\det(I-\langle Z,P^*\rangle)\cdot\det(I-\langle P,W^*\rangle)}$$

munosabat o'rinli;
4^0. Ixtiyoriy $Z \in \Re_2(m,m)$ uchun

$$\det(I - \langle\varphi_P(Z), \varphi_P(Z)\rangle) = \frac{\det(I-\langle P,P\rangle)\det(I-\langle Z,Z\rangle)}{\det(I-\langle Z,P\rangle)\det(I-\langle P,Z\rangle)}$$

5^0. $\varphi_P(\varphi_P(Z)) = Z$ (involyutsiya bo'lish xossasi);
6^0. $\varphi_P(Z)$ - gomeomorfizm bo'ladi: $\varphi_P(Z) \in Aut(\Re_2(m,m))$.

Adabiyotlar ro'yxati

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