Мн-ия, опред. несвободными действиями $\mathbb{Z}_2^k$ на $\mathbb{R}\mathcal{Z}_P$

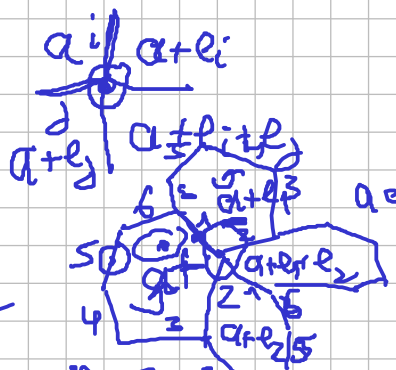
$P^n \longrightarrow \mathbb{R}\mathcal{Z}_P$ $\qquad$ $P^n\times\mathbb{Z}_2^m/\sim$ $\quad (x,a)\sim(x,b)$

$\Updownarrow$

$a-b\in\langle e_i : x\in F_i\rangle$

$F_1\dots F_m$ $\qquad \mathbb{Z}_2^m$

простое



$\bigsqcup\limits_{a\in\mathbb{Z}_2^m} P\times a$ $\qquad n=2$

$a=(a_1\ a_2\ a_3\ a_4\ a_5\ a_6)$

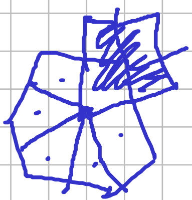
$e_i=(0\cdots,1,\cdots 0\ 0)$, $\uparrow i$

$\mathbb{Z}_2^m$, $m=6$

$a \quad b$ $\qquad 6\cdot 2^4-6\cdot 2^5+2^6=2-2g$

$a_1\dots a_6 \quad b_1\dots b_k$ $\qquad 2^n$ – в вершине $\quad 2^m$ – всего

2^{m-n} вершин в $\mathbb{R}\mathcal{Z}_P$



вырождение момент-пол многообразие

$P^n\times I^m/\sim$ $\qquad$ Дэвис–Янушкевич 91)

№85 $\quad$ А.Д. Медных $\quad$ А.Ю. Весник

P^n прямоугольный

$G(P)=\langle \rho_1\dots\rho_m\rangle$

$X\supset P$ $\qquad X/G(P)=P$

$\Lambda^n \quad \mathbb{R}^n \quad S^n$ $\qquad G(P)\xrightarrow{\varphi}\mathbb{Z}_2^m$

$\rho_i\to e_i$ $\qquad G(P)/\mathrm{Ker}=\mathbb{Z}_2^m$

$\mathrm{Ker}=G(P)'$

$\mathrm{Ker}\,\varphi$ действует свободно

$X/\mathrm{Ker}\,\varphi=\mathbb{R}\mathcal{Z}_P$ с геометрией

$G(P) \xrightarrow[\text{эпи}]{\varphi_\Lambda} \mathbb{Z}_2^r$

прямоугольный

$\rho_i \to \Lambda_i \in \mathbb{Z}_2^r$

$St_x = \langle \rho_{i_1} \dots \rho_{i_n} \rangle = \mathbb{Z}_2^n$

$\ker\varphi \subset G(P)$

действует свободно на X

$\Updownarrow$

$\forall$ вершины $x = F_{i_1} \cap \dots \cap F_{i_n}$

$\Lambda_{i_1}, \dots, \Lambda_{i_n}$ ЛНЗ

$St_x \cap \ker\varphi$

$\mathbb{Z}_2^n \xrightarrow{\Lambda} \mathbb{Z}_2^r$

$\rho_i \to \Lambda_i$

$[\Lambda_{i_1} \dots \Lambda_{i_n}]$

$X / \ker\varphi_\Lambda = \underline{\underline{N(P,\Lambda)}}$ торическое мн-ие

$P \subset \mathbb{R}^n$

может иметь вершины не общего положения

$\underline{\underline{N(P,\Lambda)}}$

$$\begin{tikzcd} G(P) \arrow[r, "\varphi_0"] \arrow[dr, "\varphi_\Lambda"'] & \mathbb{Z}_2^m \arrow[d, "\tilde\varphi_\Lambda"] \\ & \mathbb{Z}_2^r \end{tikzcd}$$

$\ker\tilde\varphi$ действует на $\mathbb{R}\mathcal{Z}_P$

$$\boxed{N(P,\Lambda) = \mathbb{R}\mathcal{Z}_P / \ker\tilde\varphi_\Lambda}$$

$P \longrightarrow \mathbb{R}\mathcal{Z}_P$

$\Lambda = (\Lambda_1 \dots \Lambda_m)$, $\Lambda_m \in \mathbb{Z}_2^r$

$H \subset \mathbb{Z}_2^m \xrightarrow{\Lambda} \mathbb{Z}_2^r$

$H(\Lambda)$

$$\boxed{\mathbb{R}\mathcal{Z}_P / H(\Lambda) = N(P,\Lambda)}$$

$\forall\ v = F_{i_1} \cap \dots \cap F_{i_n}$ $\Lambda_{i_1} \dots \Lambda_{i_n}$ ЛНЗ $\Rightarrow$ свободное д-ие

$N(P,x)$ — мн-ие

Пусть Λ — произвольный эпиморфизм $\ker(\Lambda)$ — [illegible]

$\mathbb{Z}_2^m \supset \mathbb{Z}_2^{m-1}$ всех сохр. ориентацию $= H_0$

$\boxed{x_1 + \dots + x_m = 0}$

$(x_1 \dots x_m) \in \mathbb{Z}_2^m$

$\mathbb{R}\mathcal{Z}_P / H_0 = P \sqcup_{\partial P} P = S^n$

$\mathbb{R}\mathcal{Z}_P \xrightarrow[2^{m-1}]{} H_0$

$S^n \xrightarrow{2} P$

$P\times 0 \quad P \times 1$

$\mathbb{R}\mathcal{Z}_P / H(\Lambda) = P \times \mathbb{Z}_2^r / (x,a) \sim (x,b)$

$a - b \in \langle \underline{\underline{\Lambda_i}}_{e_i} : x \in F_i \rangle$

$P \times \mathbb{Z}_2^m \qquad \mathbb{Z}_2^m / \ker \varphi = \mathbb{Z}_2^r$

$(1 \dots 1) = \Lambda_0$

$H_0 \qquad \mathbb{Z}_2^m \xrightarrow{\varphi_1} \mathbb{Z}_2$

$\varphi_1(x_1 \dots x_m) = \Sigma x_i$

$N(P, \Lambda_0) = P \times \mathbb{Z}_2 /$

$(x,a) \sim (x,b) \Leftrightarrow a - b \in \langle 1 \rangle$, $x \in F_i$

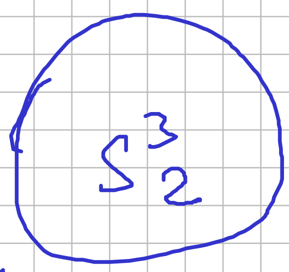
$(x,0) \sim (x,1)$

$H < \mathbb{Z}_2^m \qquad \mathbb{R}\mathcal{Z}_P / H \cong S^n$

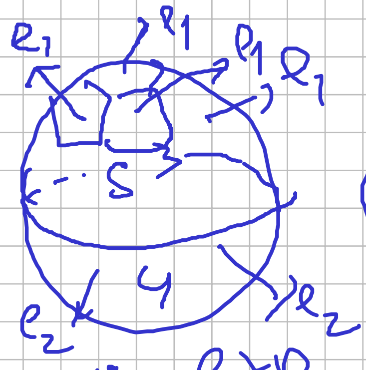
$H_0 \qquad \Sigma x_i = 0$

$\Lambda = (1 \dots 1)$

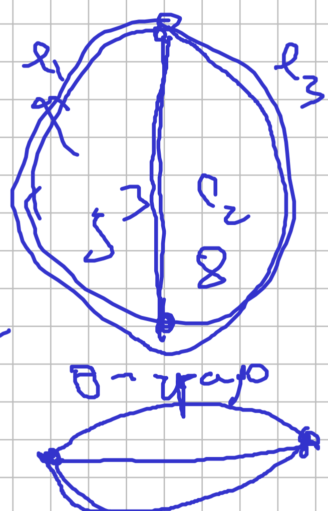
$\mathbb{D}^3 = S^3$



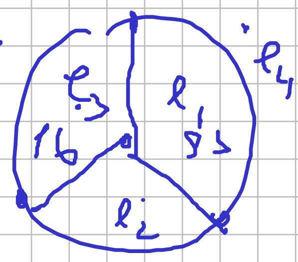
∂P



цикл $P \partial P$



θ-граф



K_4-граф

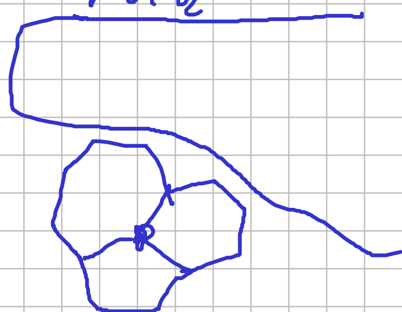
$M/G \cong S^n$

$\mathbb{R}\mathcal{Z}_P/H$

$\parallel$

$N(P,\Lambda) \cong S^3$

Λ



$G \qquad \boxed{\text{Арм строиг}}$

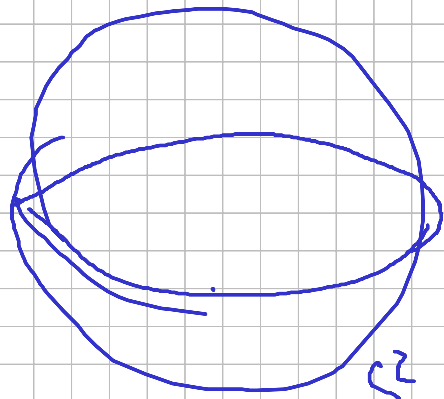
Макет $\to$ Харвей

$G : M$ смысл.

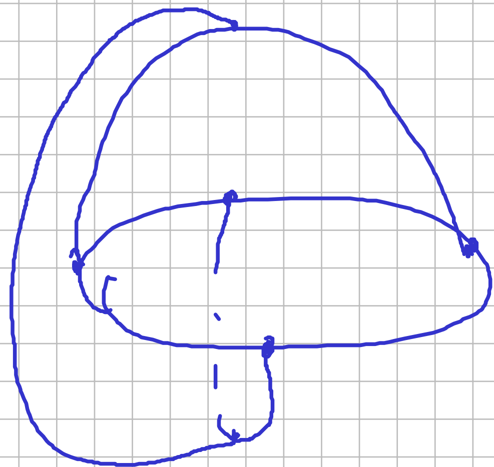
$\cup$

$H = \langle \operatorname{Fix}_x \rangle$
$x \in M$

$\boxed{G/H \cong \pi_1(M/G)}$



$\partial P^3 = S^2$



$M \xrightarrow{8} S^3$

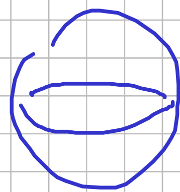
$P^{n-1} \simeq S^{n-1}_k$

$x_1^2 + \dots + x_n^2 = 1$ S^{n-1}

$\boxed{x_1 \geq 0 \ \cdots \ x_k \geq 0}$

$x_1 \geq 0$

$x_1 \geq 0$
$x_2 \geq 0$

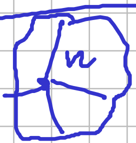


P^{n-1} вершины S^{n-1}_k $1 \leq k \leq n$

e_i

S^{n-1}

$x_k \geq 0 \ \cdots \ x_n \geq 0$



$\to k = n$

$\underbrace{F_{i_1}}_{e_1} \cap \dots \cap \underbrace{F_{i_{k-1}}}_{e_{k-1}}$ $\underset{e_k}{F_{i_k}}$ S^{n-1}_k

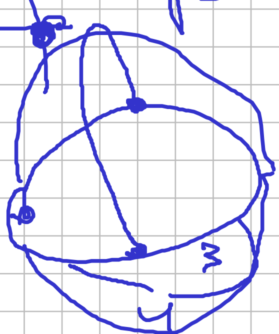
Гиперэллиптические м-ие.

M^n τ $M^n/\tau = S^n$

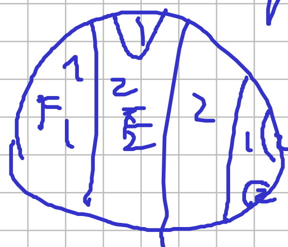
$y^2 = P(x)$

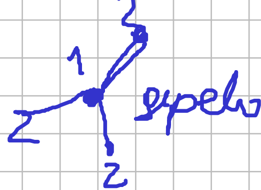
$P3$

гамильтонов цикл содержит все вершины.



$= \partial P^3 = S^2$



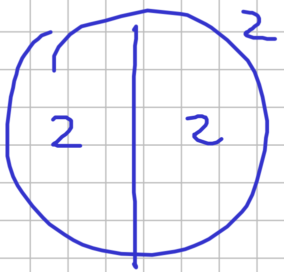


дерево

$a_1 + b_1 = a_2 + b_2 = \tau$ $\quad \mathbb{Z}_2^3 \ni \tau \quad \mathbb{Z}_2^3/\tau = \mathbb{Z}_2^2$

$e_1 \quad e_2 \quad e_3 \quad e_1+e_2+e_3$

$N(P,\lambda) \quad \mathbb{Z}_2^3 \qquad N(P,\lambda)/\tau$

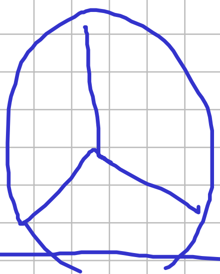


$a_1+b_1 = a_2+b_2 = a_3+b_3 = \tau$

$e_1 \quad e_4 \quad e_2 \quad e_3$

$\mathbb{Z}_2^4 \qquad M$

$N(P,\lambda)/\tau = S^3$



$a_1+b_1 = a_2+b_2 = a_3+b_3 = a_4+b_4$

$e_1 \quad e_5 \quad e_2 \quad e_3 \quad e_4$

$N(P,\lambda)/\tau = S^3$

$N(P,\lambda)$ | $N(P,\lambda)$ $\quad$ 16 $\quad \mathbb{Z}_2^4 \quad \boxed{S_2^3}$ $\quad x_1^2+x_2^2+x_3^2+x_4^2+x_5^2=$

$x_1 \geq 0 \quad x_2 \geq 0$

$x_3 \geq 0$

P^4

1 2 3

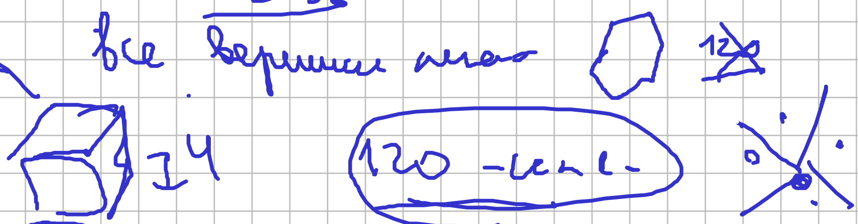
$P^3 \quad P^3 \quad P^3$

$\mathbb{Z}_2^5 \quad \mathbb{Z}_2^6$

K_5

Гипотеза: не сущ. $\mathbb{Z}_2^4$

$\cancel{P^3 \times I}$ все вершины мало $\quad \cancel{12}$



$P \qquad I^4 \qquad$ 120 - цепь

$\frac{m-4}{a \quad b}$

$e_4 \quad e_5 \qquad e_4+e_5$

Pe^4

$P^n \qquad \mathbb{R}\mathbb{Z}_P/H$ ← свободно $\quad \mathbb{Z}_2^m/H = \mathbb{Z}_2^r$

$n \geq 4 \qquad \|$

$N(P,\lambda)/\tau = S^n$

$P^3 \quad M \quad \Lambda: \mathbb{Z}_2^m \to \mathbb{Z}_2^r$

$\frac{N(P,\lambda)}{\mathbb{Z}_2^r}$

$\Lambda_1\ \Lambda_1\ \Lambda_1$

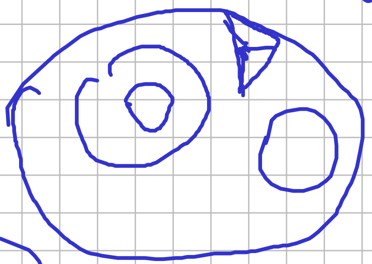
$\Lambda_1\ \Lambda_2\ \Lambda_2 \qquad \Lambda_1\ \Lambda_2\ \Lambda_1+\Lambda_2$

$\Lambda_1\ \Lambda_2\ \Lambda_3$

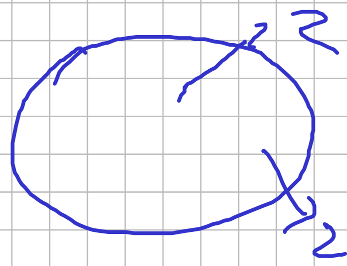
Описать все гипер-эл. инволюции в $\mathbb{Z}_2^r$

$N(P,\Lambda)/\tau = S^3$ τ

мн-ие



S^2



$N(P,\Lambda)$

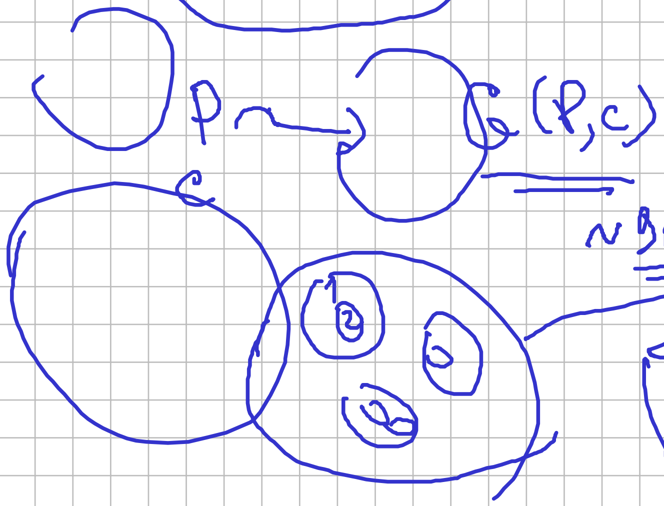
τ гиперэлл. $\in \mathbb{Z}_2^r$

$\Updownarrow$

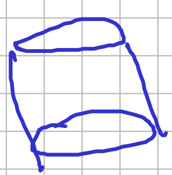
$\varnothing$ O θ K_4

в $G'(P,\Lambda)$

P $G(P,c)$



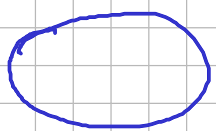
№30 [illegible]



P^3 1 2

Kotzig

P^3



гам. цикл. $\boxed{\text{Perfect 1-factorization}}$

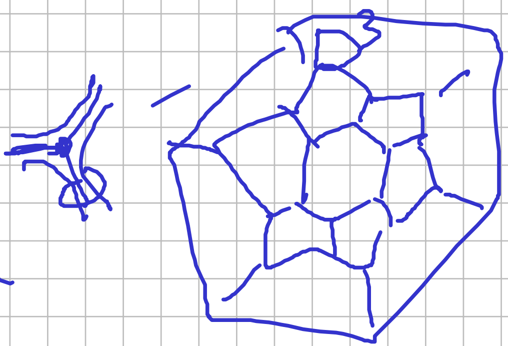
$N(P,\Lambda)$ 1 2 3

$N(P,\Lambda)$ 3 $\Leftrightarrow$ Зламинт [illegible]

(P,Λ)

$\boxed{\text{Прямоуг } \Lambda \text{ лн3}}$

$N(P,\Lambda)$ гом



P^3

$H^*(N(P,\Lambda),\mathbb{Q})$

$\parallel$

$H^*(S^3,\mathbb{Q})$