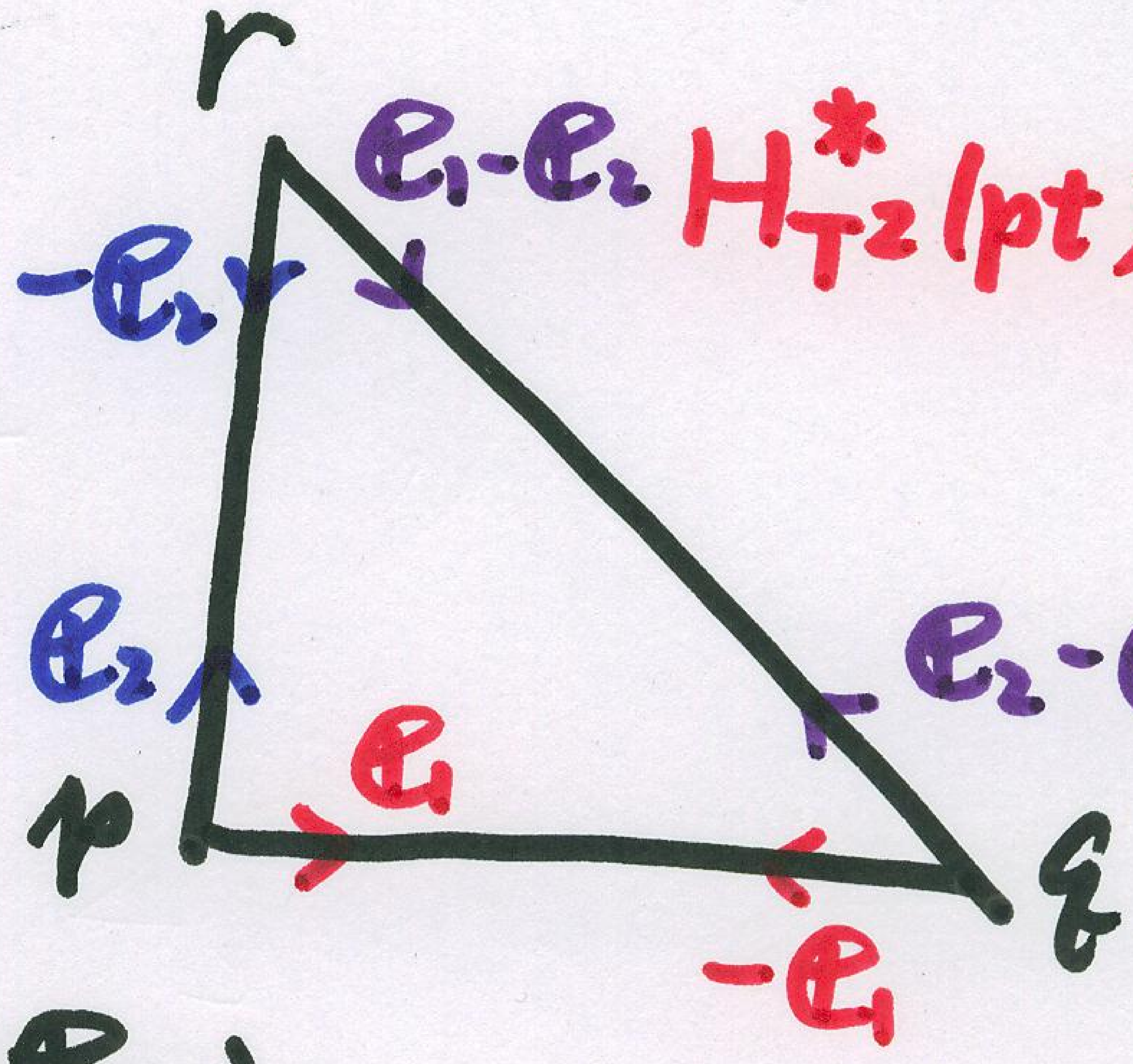
Equivariant cohomology of graph

$$H_T^*(\Gamma,\alpha) := \{ f : V^\Gamma \to H_T^*(pt) \cong \mathbb{Z}[x_1,\cdots,x_n] \text{ s.t. } f(p)-f(q) \equiv 0 \pmod{\alpha(pq)} \}$$

e.g. $f \in H_T^*(\Gamma,\alpha)$

$H_{T^2}^*(pt) \cong \mathbb{Z}[e_1,e_2]$

$\Gamma =$ 

$$\begin{cases} f(p) = e_1(2e_1+e_2) \\ f(q) = 2e_1e_2 \\ f(r) = 2e_1^2 + e_2(e_1-e_2) \end{cases}$$

check!

- $f(p)-f(q) = e_1(2e_1-e_2) \equiv 0 \pmod{\alpha(pq)}$
- $f(q)-f(r) = (2e_1+e_2)(e_2-e_1) \equiv 0 \pmod{\alpha(qr)}$
- $f(r)-f(p) = -e_2^2 \equiv 0 \pmod{\alpha(rp)}$

Thm [Chang-Skjelbred] [Goresky-Kottwitz-MacPherson]

$T \curvearrowright M$: GKM-condition

$\Rightarrow H_T^*(M) \cong H_T^*(\Gamma(M),\alpha)$