

$$1\leqslant j\leqslant r$$

$$S_j=\frac{u\in Z}{u=u^*u\text{ rank }j}$$

$$S_j\overset{k}{\rightarrow}S_j$$

$$\frac{a:\alpha\in\mathbb{T}\times\overset{\#}{\mathbb{T}}}{a=a\overset{\#}{\alpha}a:\quad\alpha=\alpha\overset{\#}{a}a}$$

$$S_j^{\mathbb{K}}=\frac{u=u^*u\in Z^{\mathbb{K}}}{\mathrm{rk}\;u=j}$$