Prop: $\sigma_0 \in C_{0,k}(\Gamma)$, $\varepsilon = \pm 1$. Dann definiert

$$\sigma \longmapsto \sum_{l=1}^{\infty} \left(T(l)\sigma_0 \#_\Gamma \sigma\right) q^l$$

eine Hecke-äquiv. $L_{\sigma_0} : C_{0,k}(\Gamma)^\varepsilon \longrightarrow S_k(\Gamma)$.
Es ex. σ_0, sodaß L_σ = Isomorphismus.

Def. $Z_1, Z_2 \in V_k^{\mathbb{R}}$, $Z_1 = \sum P_r \otimes r$, $Z_2 = \sum Q_s \otimes s$

$$Z_1 \# Z_2 := \frac{1}{2} \sum_{r,s \in \mathbb{R}} [P_r, Q_s] \operatorname{sign}(s-r)$$

Def. k gerade, $\varphi = aX^2 + bXY + cY^2$ pos. def., $a,b,c \in \mathbb{Z}$, $D = b^2 - 4ac \neq \square$ (>0)

Setze $C_\varphi := \varphi^{k/2} \otimes (\lambda_+ - \lambda_-) \in V_k^{\mathbb{R}}$, $\quad \lambda_\pm = \dfrac{-b \pm \sqrt{D}}{2a}$

Def. $[C_\varphi]$ via

$$\int_{(f,g)}^{[C_\varphi]} = \int_{\Gamma_\varphi \backslash \lambda_- \frown \lambda_+} \varphi(\tau,1)^{k/2} f(\tau)\, d\tau + \overline{\;\cdots\;}\; g(\bar\tau)\, d\bar\tau .$$

Satz 2 $\sigma_1 = [Z_1] \in C_{0,k}(\Gamma)$, $\sigma_2 = [Z_2] \in C_{0,k}(\Gamma)$.

a) Z_2 Heegner Zykel:

$$Z_1 \#_\Gamma Z_2 = \sum_{Z \in \Gamma \cdot Z_2} Z_1 \# Z$$

b) $Z_2 \in V_k$, so

$$Z_1 \#_\Gamma Z_2 = \text{„reg."} \sum_{Z \in \Gamma Z_2} Z_1 \# Z$$

Satz $\varepsilon \in \pm 1$, $D \underset{4m}{\equiv} r^2$, D fundamental, $D\varepsilon > 0$. Dann def.

$$\sigma \longmapsto j^{\varepsilon}_{D,r}(\sigma) = \sum_{\substack{\Delta, \rho \\ \Delta D > 0}} \Bigg(\sum_{\substack{\varphi = [a,b,c] \\ \operatorname{disc} \varphi = D\Delta \\ m \mid a,\ b \equiv \rho\ (4m)}} \chi_D(\varphi)\, [C_\varphi] \#_\Gamma \sigma \Bigg) e^{2\pi i \left(\frac{r^2 - \Delta}{4m} u + \ldots\right)}$$

Hecke-äquiv. Abb. $C_{0,k}^{(-1)^{k-1}}(\Gamma_0(m)) \longrightarrow S^{\varepsilon}_{k,m}$.
Eine LK dieser Abb. ist surjektiv.