Yacobi on Quantum Groups at Roots of Unity

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Plan. 1. $U_q(\mathfrak{g})|_{q=e^{\frac{2\pi i}{k}}} = \zeta_k$

2. Weyl/tilting modules

3. $\mathcal{C}^{\mathrm{int}}(\mathfrak{g}, \zeta_k)$ an MTC.

Recall

$q \in \mathbb{C}^\times$ $U_q(sl_2)$ is a $\mathbb{C}$-alg

gens: E, F, K, K^{-1} $\quad KEK^{-1} = q^2 E$

rels $[E,F] = \frac{K-K^{-1}}{q-q^{-1}}$ $\quad KFK^{-1} = q^{-2}F$

Assuming q not a root of unity,

$V_q(n) = \mathrm{Sym}^n(\mathbb{C}^{2*}) = \mathbb{C}^n[x,y]$

$E \sim x\frac{\partial}{\partial y}$ really $E x^{n-i} y^i = [i] x^{n-i+1} y^{i-1}$

$F \sim y \frac{\partial}{\partial x}$ $\quad [n] = \frac{q^n - q^{-n}}{q - q^{-1}}$

$K x^{n-i} y^i = q^{n-2i} x^{n-i} y^i$ $\quad U_q(\mathfrak{g})$ is a quasi-triang. Hopf algebra.
