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ON ζ_n-WEYL ALGEBRA $W_r(\zeta_n, Z)$

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0.

Weyl algebra is an associative algebra generated by two elements $\hat{a}$ and a over $\boldsymbol{R}$ such that the generating relation is given by

$$\hat{a}a - a\hat{a} = 1\,,$$

which is isomorphic to the algebra of differential operators

$$\boldsymbol{R}\left[z, \frac{d}{dz}\right].$$

q analog of Weyl algebra $W_1(q, \boldsymbol{R})$ is an associative algebra with two generators $\hat{a}$ and a such that the generating relations is

$$\hat{a}a - qa\hat{a} = 1\,.$$

If q is not a root of unity of finite degree, q-analog $W_1(q, \boldsymbol{R})$ is isomorphic to the algebra of q-Differential operators

$$\boldsymbol{R}[z, D_q]\,,$$

where

$$D_q(f(z)) = \frac{f(z) - f(qz)}{z(1-q)}\,.$$

q-analog of Weyl algebra is sometimes called q-quatisation by physisist ([2], [3]).

Exceptional case $q = a$ primitive n-th root of unity ζ_n, $W_1(\zeta_n, Z)$ has quite beautiful properties; standard elements $\hat{a}^n$, a^n, $\hat{a}a - a\hat{a}$ play important part of role.

§ 1.

We mean by ζ_n a primitive n-th root of unity, and define ζ_n-analog of Weyl algebra $Z[z, d/dz]$ as follows;

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