Reducibility of canonical t-cyclic monomial matrices over commutative local rings

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We study canonical t-cyclic matrices over commutative local rings.

Let K be a commutative local ring with radical $R \neq 0$ and let $t \in R$ such that $t^m = 0$, $t^{m-1} \neq 0$.

A cyclic matrix of the form

$$A = M_t(\overline{a}) = \begin{pmatrix} 0 & \dots & 0 & a_n \\ a_1 & \dots & 0 & 0 \\ \vdots & \ddots & \vdots & \vdots \\ 0 & \dots & a_{n-1} & 0 \end{pmatrix},$$

is called canonical cyclic. The sequence $\overline{a} = (a_1, \dots, a_{n-1}, a_n)$ is called the defining sequence of A. If all elements a_i have the form t^{s_i} $(t \in K)$, where $s_i \geq 0$ $(i = 1, 2, \dots, n)$, the matrix A is called canonical t-cyclic [**3**].

Theorem 1. *Any canonical t-cyclic matrix over K with defining sequence containing subsequence $(t^i, t^{p+q}, t^j, 1)$, where $i + q \geq m$, $j + p \geq m$, is reducible.*

Corollary 1. *Any canonical t-cyclic matrix over K with defining sequence containing subsequence $(t^{m-1}, t^2, t^{m-1}, 1)$ is reducible.*

References

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