Appendix B

Theorem *(Theorem S1.10 in [7]) Let* $L(\omega)$ *be an* $n \times n$ *matrix polynomial with* $detL(\omega) \neq 0$. *Then for every* $\omega_o \in \mathbb{C}$, $L(\omega)$ *admits the representation*

$$L(\omega) = E_{\omega_o} \begin{bmatrix} (\omega - \omega_o)^{\kappa_1} & & 0 \\ & \ddots & \\ 0 & & (\omega - \omega_o)^{\kappa_n} \end{bmatrix} F_{\omega_o},$$

where E_{ω_o} *and* F_{ω_o} *are matrix polynomials invertible at* ω_o, *and* $\kappa_1 \leq \kappa_2, \ldots \leq \kappa_n$ *are nonnegative integers, which coincide (after striking off zeros) with the degrees of the elementary divisors of* $L(\omega)$ *corresponding to* ω_o *(i.e., of the form* $(\omega - \omega_0)^n$*).*

The integers $\kappa_1 \leq \kappa_2, \ldots \leq \kappa_n$ are uniquely determined by $L(\omega)$ and ω_o; they are called the *partial multiplicities* of $L(\omega)$ at ω_o.