Resumo da Pesquisa PPGEM

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1 Fundamentos da Pesquisa

$$H_{uq}u - G_{uu}q + \lambda W_{uq}u + \lambda S_{uu}q = \lambda^2 M_{uq}u \tag{1}$$

$$H_{qq}u - G_{qu}q + \lambda W_{qq}u + \lambda S_{qu}q = \lambda^2 M_{qq}u \tag{2}$$

A partir da equação 1

$$(H_{uq} + \lambda W_{uq})u + (\lambda S_{uu} - G_{uu})q = \lambda^2 M_{uq}u \tag{3}$$

$$(\lambda S_{uu} - G_{uu})q = (\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u \tag{4}$$

$$q = (\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})(\lambda S_{uu} - G_{uu})^{-1}u \tag{5}$$

$$q = (\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})(\frac{1}{\lambda}S_{uu}^{-1} - G_{uu}^{-1})u \tag{6}$$

$$Z = (\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq}) \tag{7}$$

$$q = (Zu)(\frac{1}{\lambda}S_{uu}^{-1} - G_{uu}^{-1}) \tag{8}$$

$$H_{qq}u - G_{qu}(Zu)(\frac{1}{\lambda}S_{uu}^{-1} - G_{uu}^{-1}) + \lambda W_{qq}u + \lambda S_{qu}(Zu)(\frac{1}{\lambda}S_{uu}^{-1} - G_{uu}^{-1}) = \lambda^2 M_{qq}u \tag{9}$$

$$H_{qq}u - (\frac{1}{\lambda})G_{qu}S_{uu}^{-1}(Zu) + G_{qu}G_{uu}^{-1}(Zu) + \lambda W_{qq}u + S_{qu}S_{uu}^{-1}(Zu) - \lambda S_{qu}G_{uu}^{-1}(Zu) = \lambda^2 M_{qq}u \tag{10}$$

$$H_{qq}u + \lambda W_{qq}u - (\frac{1}{\lambda})G_{qu}S_{uu}^{-1}(Zu) + G_{qu}G_{uu}^{-1}(Zu) + S_{qu}S_{uu}^{-1}(Zu) - \lambda S_{qu}G_{uu}^{-1}(Zu) = \lambda^2 M_{qq}u \tag{11}$$

$$H_{qq}u + \lambda W_{qq}u + (-(\frac{1}{\lambda})G_{qu}S_{uu}^{-1} + G_{qu}G_{uu}^{-1} + S_{qu}S_{uu}^{-1} - \lambda S_{qu}G_{uu}^{-1})(Zu) = \lambda^2 M_{qq}u \tag{12}$$

$$H_{qq}u + \lambda W_{qq}u + (-(\frac{1}{\lambda})G_{qu}S_{uu}^{-1} + G_{qu}G_{uu}^{-1} + S_{qu}S_{uu}^{-1} - \lambda S_{qu}G_{uu}^{-1})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u = \lambda^2 M_{qq}u \tag{13}$$

$$\begin{aligned} H_{qq}u + \lambda W_{qq}u - (\frac{1}{\lambda}G_{qu}S_{uu}^{-1})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u + (G_{qu}G_{uu}^{-1})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u \\ +(S_{qu}S_{uu}^{-1})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u - (\lambda S_{qu}G_{uu}^{-1})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u = \lambda^2 M_{qq}u \end{aligned} \tag{14}$$

Assumindo:

$$G_{qu}S_{uu}^{-1} = V_{qu} \tag{15}$$

$$G_{qu}G_{uu}^{-1} = T_{qu} \tag{16}$$

$$S_{qu}S_{uu}^{-1} = X_{qu} \tag{17}$$

$$S_{qu}G_{uu}^{-1} = Y_{qu} \tag{18}$$

$$\begin{aligned} H_{qq}u + \lambda W_{qq}u - (\frac{1}{\lambda}V_{qu})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u + (T_{qu})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u \\ +(X_{qu})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u - (\lambda Y_{qu})(\lambda^2 M_{uq} - H_{uq} - \lambda W_{uq})u = \lambda^2 M_{qq}u \end{aligned} \tag{19}$$

$$\begin{aligned} H_{qq}u + \lambda W_{qq}u - (\frac{1}{\lambda})(\lambda^2 V_{qu}M_{uq} - V_{qu}H_{uq} - \lambda V_{qu}W_{uq})u + (\lambda^2 T_{qu}M_{uq} - T_{qu}H_{uq} - \lambda T_{qu}W_{uq})u \\ +(\lambda^2 X_{qu}M_{uq} - X_{qu}H_{uq} - \lambda X_{qu}W_{uq})u - (\lambda)(\lambda^2 Y_{qu}M_{uq} - Y_{qu}H_{uq} - \lambda Y_{qu}W_{uq})u = \lambda^2 M_{qq}u \end{aligned} \tag{20}$$

$$\frac{u}{\lambda}(V_{qu}H_{uq}) \tag{21}$$
$$+u(H_{qq}+V_{qu}W_{uq}-T_{qu}H_{uq}-X_{qu}H_{uq}) \tag{22}$$
$$+\lambda u(W_{qq}-V_{qu}M_{uq}-T_{qu}W_{uq}-X_{qu}W_{uq}+Y_{qu}H_{uq}) \tag{23}$$
$$+\lambda^2 u(T_{qu}M_{uq}+X_{qu}M_{uq}+Y_{qu}W_{uq}-M_{qq}) \tag{24}$$
$$-\lambda^3 u(Y_{qu}M_{uq})=0 \tag{25}$$

$$\begin{aligned} u(V_{qu}H_{uq})+\lambda u(H_{qq}+V_{qu}W_{uq}-T_{qu}H_{uq}-X_{qu}H_{uq}) \\ +\lambda^2 u(W_{qq}-V_{qu}M_{uq}-T_{qu}W_{uq}-X_{qu}W_{uq}+Y_{qu}H_{uq}) \\ +\lambda^3 u(T_{qu}M_{uq}+X_{qu}M_{uq}+Y_{qu}W_{uq}-M_{qq})-\lambda^4 u(Y_{qu}M_{uq})=0 \end{aligned} \tag{26}$$

$$A=V_{qu}H_{uq} \tag{27}$$
$$B=H_{qq}+V_{qu}W_{uq}-T_{qu}H_{uq}-X_{qu}H_{uq} \tag{28}$$
$$C=W_{qq}-V_{qu}M_{uq}-T_{qu}W_{uq}-X_{qu}W_{uq}+Y_{qu}H_{uq} \tag{29}$$
$$D=T_{qu}M_{uq}+X_{qu}M_{uq}+Y_{qu}W_{uq}-M_{qq} \tag{30}$$
$$E=Y_{qu}M_{uq} \tag{31}$$

$$\begin{aligned} u(G_{qu}S_{uu}^{-1}H_{uq})+\lambda u(H_{qq}+G_{qu}S_{uu}^{-1}W_{uq}-G_{qu}G_{uu}^{-1}H_{uq}-S_{qu}S_{uu}^{-1}H_{uq}) \\ +\lambda^2 u(W_{qq}-G_{qu}S_{uu}^{-1}M_{uq}-G_{qu}G_{uu}^{-1}W_{uq}-S_{qu}S_{uu}^{-1}W_{uq}+S_{qu}G_{uu}^{-1}H_{uq}) \\ +\lambda^3 u(G_{qu}G_{uu}^{-1}M_{uq}+S_{qu}S_{uu}^{-1}M_{uq}+S_{qu}G_{uu}^{-1}W_{uq}-M_{qq}) \\ -\lambda^4 u(S_{qu}G_{uu}^{-1}M_{uq})=0 \end{aligned} \tag{32}$$

$$uA+\lambda uB+\lambda^2 uC+\lambda^3 uD-\lambda^4 uE=0 \tag{33}$$