1. Appendix: Integral Forms

This appendix contains the full expansion of the integrals that appear in the paper. Their complete expressions are as follows:

$$I_{11}\left(L_0,L,P_{10},P_{20}\right)=-\frac{2}{B}\left[\Lambda_0\left(\mathcal{L}\right)\right]_{L_0}^{L} \qquad [1]$$

$$I_{12}\left(L_0,L,P_{10},P_{20}\right)=\left[-\frac{2}{B^3}\Lambda_0\left(\mathcal{L}\right)-\frac{1}{P_{20}B^2}\frac{P_{10}+\left(P_{10}{}^2+P_{20}{}^2\right)\sin\mathcal{L}}{\Phi_0\left(\mathcal{L}\right)}\right]_{L_0}^{L} \qquad [2]$$

$$I_{13}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{2}\left[\begin{array}{l}-\dfrac{2\left(2+P_{10}{}^2+P_{20}{}^2\right)}{B_0{}^5}\Lambda_0\left(\mathcal{L}\right)+\\ -\dfrac{1}{P_{20}B_0{}^2}\left(\begin{array}{l}\dfrac{P_{10}+\left(P_{10}{}^2+P_{20}{}^2\right)\sin\mathcal{L}}{\Phi_0{}^2\left(\mathcal{L}\right)}\\ +\dfrac{P_{10}\left(2+P_{10}{}^2+P_{20}{}^2\right)+3\left(P_{10}{}^2+P_{20}{}^2\right)\sin\mathcal{L}}{B_0\Phi_0\left(\mathcal{L}\right)}\end{array}\right)\end{array}\right]_{L_0}^{L} \qquad [3]$$

$$I_{c2}\left(L_0,L,P_{10},P_{20}\right)=\left[\frac{2P_{20}}{B_0{}^3}\Lambda_0\left(\mathcal{L}\right)+\frac{1}{B_0{}^2}\left(\frac{P_{10}+\sin\mathcal{L}}{\Phi_0\left(\mathcal{L}\right)}\right)\right]_{L_0}^{L} \qquad [4]$$

$$I_{s2}\left(L_0,L,P_{10},P_{20}\right)=\left[\frac{2P_{10}}{B_0{}^3}\Lambda_0\left(\mathcal{L}\right)-\frac{1}{P_{20}B_0{}^2}\left(\frac{P_{20}{}^2-1-P_{10}\sin\mathcal{L}}{\Phi_0\left(\mathcal{L}\right)}\right)\right]_{L_0}^{L} \qquad [5]$$

$$I_{c3}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{2}\left[\frac{6P_{20}}{B_0{}^5}\Lambda_0\left(\mathcal{L}\right)+\frac{1}{B_0{}^2}\left(\begin{array}{l}\dfrac{P_{10}+\sin\mathcal{L}}{\Phi_0{}^2\left(\mathcal{L}\right)}+\\ \dfrac{3P_{10}+\left(1+2\left(P_{10}{}^2+P_{20}{}^2\right)\right)\sin\mathcal{L}}{B_0{}^2\Phi_0\left(\mathcal{L}\right)}\end{array}\right)\right]_{L_0}^{L} \qquad [6]$$

$$I_{s3}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{2}\left[\frac{6P_{10}}{B_0{}^5}\Lambda_0\left(\mathcal{L}\right)+\frac{1}{P_{20}B_0{}^2}\left(\begin{array}{l}\dfrac{1-P_{20}{}^2+P_{10}\sin\mathcal{L}}{\Phi_0{}^2\left(\mathcal{L}\right)}+\\ \dfrac{P_{10}\left(3P_{10}+\left(1+2\left(P_{10}{}^2+P_{20}{}^2\right)\right)\sin\mathcal{L}\right)}{B_0{}^2\Phi_0\left(\mathcal{L}\right)}\end{array}\right)\right]_{L_0}^{L} \qquad [7]$$

$$I_{t1}=\left(I_{13}-\frac{I_{12}}{\Phi_0\left(L_0\right)}\right) \qquad [8]$$

$$I_{t2}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{2\left(1-P_{20}\right)B_0^{\,3}}\left[\begin{array}{l}2\left(P_{20}-1\right)\Lambda_0^{\,2}\left(\mathcal{L}\right)+\\ \cos\left(2\Lambda_0\left(\mathcal{L}\right)\right)\left(2P_{10}B_0\Lambda_0\left(\mathcal{L}\right)-\left(P_{10}^{\,2}+P_{20}^{\,2}\right)+P_{20}\right)+\\ -\sin\left(2\Lambda_0\left(\mathcal{L}\right)\right)\left(2P_{10}B_0+\left(\left(P_{10}^{\,2}+P_{20}^{\,2}\right)-P_{20}\right)\Lambda_0\left(\mathcal{L}\right)\right)\end{array}\right]_{L_0}^{L} \quad [9]$$

$$\Lambda_0\left(L\right)=\operatorname{atan}\left(\frac{1}{B}\left(-P_{10}+\left(P_{20}-1\right)\tan\left(\frac{L}{2}\right)\right)\right) \quad [10]$$

$$I_{2c3}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{B_0^{\,4}}\left[\begin{array}{l}\dfrac{P_{10}^{\,2}-2P_{20}^{\,2}-1}{B_0}\Lambda_0\left(\mathcal{L}\right)-\\ \dfrac{\left(\begin{array}{l}\Phi_0\left(\mathcal{L}\right)(P_{10}(2-3P_{10}^{\,2}+P_{10}^{\,4}+(5P_{10}^{\,2}-3)P_{20}^{\,2}+4P_{20}^{\,4})+\\ (P_{10}^{\,2}-P_{10}^{\,4}-P_{20}^{\,2}+3P_{10}^{\,2}P_{20}^{\,2}+4P_{20}^{\,4})\sin\mathcal{L})+\\ B_0^{\,2}\left(P_{10}\left(-1+P_{10}^{\,2}-2P_{20}^{\,2}\right)+\left(P_{20}^{\,2}-P_{10}^{\,2}B_0^{\,2}\right)\sin\mathcal{L}\right)\end{array}\right)}{4P_{20}\left(P_{10}^{\,2}+P_{20}^{\,2}\right)\Phi_0^{\,2}\left(\mathcal{L}\right)}\end{array}\right]_{L_0}^{L} \quad [11]$$

$$I_{1c1s3}\left(L_0,L,P_{10},P_{20}\right)=\frac{1}{B_0^{\,2}}\left[\begin{array}{l}-\dfrac{3P_{10}P_{20}}{B_0^{\,3}}\Lambda_0\left(\mathcal{L}\right)+\\ \dfrac{\left(\begin{array}{l}(-1+P_{20}^{\,2}+P_{10}(-2+P_{10}^{\,2}+P_{20}^{\,2})\sin\mathcal{L})-\\ \Phi_0\left(\mathcal{L}\right)(-P_{10}^{\,4}+P_{10}^{\,2}(-4+P_{20}^{\,2})+\\ 2(P_{20}^{\,2}-1)^2-P_{10}(-2+5(P_{10}^{\,2}+P_{20}^{\,2}))\sin\mathcal{L})\end{array}\right)}{2\Phi_0^{\,2}\left(\mathcal{L}\right)}\end{array}\right]_{L_0}^{L} \quad [12]$$

$$I_{2s3}\left(L_0,L,P_{10},P_{20}\right)=\left[\begin{array}{l}\dfrac{P_{20}^{\,2}-2P_{10}^{\,2}-1}{B_0^{\,5}}\Lambda_0\left(\mathcal{L}\right)-\\ \dfrac{\left(\begin{array}{l}\Phi_0\left(\mathcal{L}\right)(P_{10}(2-5P_{10}^{\,2}+(3P_{10}^{\,2}-5)P_{20}^{\,2}+3P_{20}^{\,4})+\\ (P_{10}^{\,2}-4P_{10}^{\,4}-P_{20}^{\,2}-3P_{10}^{\,2}P_{20}^{\,2}+P_{20}^{\,4})\sin\mathcal{L})-\\ B_0^{\,2}\left(P_{10}\left(1-P_{20}^{\,2}\right)+\left(P_{10}^{\,2}-P_{20}^{\,2}B_0^{\,2}\right)\sin\mathcal{L}\right)\end{array}\right)}{2P_{20}B_0^{\,2}\left(P_{10}^{\,2}+P_{20}^{\,2}\right)\Phi_0^{\,2}\left(\mathcal{L}\right)}\end{array}\right]_{L_0}^{L} \quad [13]$$

$$F\left(\varphi,k\right)=\int_0^{\varphi}\frac{d\theta}{\sqrt{1-k\sin^2\theta}} \quad [14]$$

$$E\left(\varphi,k\right)=\int_0^{\varphi}\sqrt{1-k\sin^2\theta}\,d\theta \quad [15]$$

$$I_a=\left[\frac{1}{1-e_0}E\left(\frac{\vartheta}{2},\frac{4e_0}{\left(1+e_0\right)^2}\right)+\frac{1}{1+e_0}F\left(\frac{\vartheta}{2},\frac{4e_0}{\left(1+e_0\right)^2}\right)-\frac{\sqrt{1+e_0^{\,2}+2e_0\cos\vartheta}\,e_0\sin\vartheta}{\left(1-e_0\right)^2\left(1+e_0\cos\vartheta\right)}\right]_{\theta_0}^{\theta} \quad [16]$$

$$I_{P1}=\frac{1}{e_0\left(1-e_0\right)}\left[\begin{array}{l} E\left(\dfrac{\vartheta}{2},\dfrac{4e_0}{\left(1+e_0\right)^2}\right)-\dfrac{1+{e_0}^2}{\left(1+e_0\right)^2}F\left(\dfrac{\vartheta}{2},\dfrac{4e_0}{\left(1+e_0\right)^2}\right)+ \\ +\dfrac{1}{2\left(1+e_0\right)}\log\left(\dfrac{\sqrt{1+{e_0}^2+2e_0\cos\vartheta}+e_0\sin\vartheta}{\sqrt{1+{e_0}^2+2e_0\cos\vartheta}-e_0\sin\vartheta}\right)+ \\ -\dfrac{\sqrt{1+{e_0}^2+2e_0\cos\vartheta}\,e_0\sin\vartheta}{\left(1+e_0\right)\left(1+e_0\cos\vartheta\right)} \end{array}\right]_{\theta_0}^{\theta} \quad [17]$$

$$I_{P2}=-\frac{1}{e_0\left(1-{e_0}^2\right)}\left[\frac{2}{\sqrt{1-{e_0}^2}}\operatorname{atan}\left(\frac{\sqrt{1+{e_0}^2+2e_0\cos\vartheta}}{\sqrt{1-{e_0}^2}}\right)+\frac{\sqrt{1+{e_0}^2+2e_0\cos\vartheta}}{\left(1+e_0\cos\vartheta\right)}\right]_{\theta_0}^{\theta} \quad [18]$$

$$I_{Ja}\left(L_0,L,P_{10},P_{20}\right)=-\left[\begin{array}{l}
-3\begin{pmatrix} G_0^2P_{20}(4+P_{10}^2+P_{20}^2)-2P_{20}(18+3P_{10}^2+5P_{20}^2)Q_{10}^{\,2}+ \\ 4P_{10}(6+P_{10}^2+3P_{20}^2)Q_{10}Q_{20}-2P_{20}(6+3P_{10}^2+P_{20}^2)Q_{20}^{\,2} \end{pmatrix}\cos\mathcal{L}+ \\
6\left(G_0^2(P_{10}-P_{20})(P_{10}+P_{20})+4(1+3P_{20}^2)Q_{10}^{\,2}-4(1+3P_{10}^2)Q_{20}^{\,2}\right)\cos\left(2\mathcal{L}\right)+ \\
\begin{pmatrix} G_0^2(3P_{10}^2P_{20}-P_{20}^3)+3P_{20}(12-3P_{10}^2+5P_{20}^2)Q_{10}^{\,2}+ \\ 18P_{10}(4+P_{10}^2+P_{20}^2)Q_{10}Q_{20}-3P_{20}(12+9P_{10}^2+P_{20}^2)Q_{20}^{\,2} \end{pmatrix}\cos\left(3\mathcal{L}\right)+ \\
18\left(P_{20}(Q_{10}-Q_{20})+P_{10}(Q_{10}+Q_{20})\right)\left(P_{10}(Q_{20}-Q_{10})+P_{20}(Q_{10}+Q_{20})\right)\cos\left(4\mathcal{L}\right)+ \\
3\begin{pmatrix} -2P_{10}^3Q_{10}Q_{20}+6P_{10}P_{20}^2Q_{10}Q_{20}+ \\ P_{20}^3(Q_{10}-Q_{20})(Q_{10}+Q_{20})+3P_{10}^2P_{20}(-Q_{10}^{\,2}+Q_{20}^{\,2}) \end{pmatrix}\cos\left(5\mathcal{L}\right)+ \\
-3\begin{pmatrix} G_0^2P_{10}(4+P_{10}^2+P_{20}^2)-2P_{10}(6+P_{10}^2+3P_{20}^2)Q_{10}^{\,2}+ \\ 4P_{20}(6+3P_{10}^2+P_{20}^2)Q_{10}Q_{20}-2P_{10}(5P_{10}^2+3(6+P_{20}^2))Q_{20}^{\,2} \end{pmatrix}\sin\left(\mathcal{L}\right)+ \\
-12\begin{pmatrix} G_0^2P_{10}P_{20}+6P_{10}^2Q_{10}Q_{20}+ \\ 2(2+3P_{20}^2)Q_{10}Q_{20}-6P_{10}P_{20}(Q_{10}^{\,2}+Q_{20}^{\,2}) \end{pmatrix}\sin\left(2\mathcal{L}\right)+ \\
\begin{pmatrix} G_0^2(P_{10}^3-3P_{10}P_{20}^2)+3P_{10}(12+P_{10}^2+9P_{20}^2)Q_{10}^{\,2}+ \\ -18P_{20}(4+P_{10}^2+P_{20}^2)Q_{10}Q_{20}-3P_{10}(12+5P_{10}^2-3P_{20}^2)Q_{20}^{\,2} \end{pmatrix}\sin\left(3\mathcal{L}\right)+ \\
36\left(P_{20}Q_{10}+P_{10}Q_{20}\right)\left(P_{20}Q_{20}-P_{10}Q_{10}\right)\sin\left(4\mathcal{L}\right)+ \\
3\begin{pmatrix} 6P_{10}^2P_{20}Q_{10}Q_{20}-2P_{20}^3Q_{10}Q_{20}+ \\ 3P_{10}P_{20}^2(Q_{10}-Q_{20})(Q_{10}+Q_{20})+P_{10}^3(-Q_{10}^{\,2}+Q_{20}^{\,2}) \end{pmatrix}\sin\left(5\mathcal{L}\right)
\end{array}\right]_{L_0}^{L}$$

[19]

$$I_{JP_1}\left(L_0, L, P_{10}, P_{20}\right) = -\left[\begin{array}{l}
-12P_{20}\left(G_0^2 + 2(-4+Q_{10}^{\ 2}+Q_{20}^{\ 2})(Q_{10}^{\ 2}+Q_{20}^{\ 2})\right)\mathcal{L} + \\
6\begin{pmatrix} G_0^2 P_{10}P_{20} - 10P_{10}^2 Q_{10}Q_{20} + \\ 2P_{10}P_{20}(Q_{10}^{\ 4} + 2(-5+2Q_{10}^{\ 2})Q_{20}^{\ 2} + 3Q_{20}^{\ 4}) \\ -2Q_{10}Q_{20}(2+P_{20}^2(-5+2Q_{10}^{\ 2}+2Q_{20}^{\ 2})) \end{pmatrix}\cos\mathcal{L} + \\
6\begin{pmatrix} G_0^2 P_{10} + 4(P_{10}(Q_{10}^{\ 2} - 4Q_{20}^{\ 2}) + \\ -P_{20}Q_{10}Q_{20}(-4+Q_{10}^{\ 2}+Q_{20}^{\ 2})) \end{pmatrix}\cos\left(2\mathcal{L}\right) + \\
2\begin{pmatrix} G_0^2 P_{10}P_{20} + 17P_{10}^2 Q_{10}Q_{20} + \\ P_{10}P_{20}(-5Q_{10}^{\ 2} + 2Q_{10}^{\ 4} - 7Q_{20}^{\ 2} - 2Q_{20}^{\ 4}) \\ +Q_{10}Q_{20}(28+P_{20}^2(15-4Q_{10}^{\ 2}-4Q_{20}^{\ 2})) \end{pmatrix}\cos\left(3\mathcal{L}\right) + \\
18\left(2P_{20}Q_{10}Q_{20} + P_{10}(-Q_{10}^{\ 2}+Q_{20}^{\ 2})\right)\cos\left(4\mathcal{L}\right) + \\
6\left(P_{20}Q_{10} + P_{10}Q_{20}\right)\left(-P_{10}Q_{10} + P_{20}Q_{20}\right)\cos\left(5\mathcal{L}\right) + \\
-3\begin{pmatrix} G_0^2(4+P_{10}^2+3P_{20}^2) - 20Q_{10}^{\ 2} - 28Q_{20}^{\ 2} + \\ 6P_{10}^2(Q_{10}^{\ 2} - 3Q_{20}^{\ 2}) - 8P_{10}P_{20}Q_{10}Q_{20}(-6+Q_{10}^{\ 2}+Q_{20}^{\ 2}) \\ +2P_{20}^2(6Q_{10}^{\ 4} - 7Q_{20}^{\ 2} + 2Q_{20}^{\ 4} + Q_{10}^{\ 2}(-19+8Q_{20}^{\ 2})) \end{pmatrix}\sin\left(\mathcal{L}\right) + \\
-6\left(G_0^2 P_{20} + 20P_{10}Q_{10}Q_{20} + 2P_{20}(-7Q_{10}^{\ 2} + Q_{10}^{\ 4} + Q_{20}^{\ 2} - Q_{20}^{\ 4})\right)\sin\left(2\mathcal{L}\right) + \\
\begin{pmatrix} G_0^2(P_{10}-P_{20})(P_{10}+P_{20}) + Q_{10}^{\ 2}(28+11P_{10}^2+P_{20}^2(21-4Q_{10}^{\ 2})) \\ -4P_{10}P_{20}(Q_{10}+2Q_{10}^{\ 3})Q_{20} - (28+23P_{10}^2+9P_{20}^2)Q_{20}^{\ 2} + \\ -8P_{10}P_{20}Q_{10}Q_{20}^{\ 3} + 4P_{20}^2Q_{20}^{\ 4} \end{pmatrix}\sin\left(3\mathcal{L}\right) + \\
18\left(2P_{10}Q_{10}Q_{20} + P_{20}(Q_{10}^{\ 2} - Q_{20}^{\ 2})\right)\sin\left(4\mathcal{L}\right) + \\
3\left(P_{20}(Q_{10}-Q_{20}) + P_{10}(Q_{10}+Q_{20})\right)\left(P_{10}(-Q_{10}+Q_{20}) + P_{20}(Q_{10}+Q_{20})\right)\sin\left(5\mathcal{L}\right)
\end{array}\right] \quad [20]$$

$$
I_{JP_2}\left(L_0, L, P_{10}, P_{20}\right) = -\left[\begin{array}{l}
12P_{10}\left(G_0^2 + 2(-4 + Q_{10}^2 + Q_{20}^2)(Q_{10}^2 + Q_{20}^2)\right)\mathcal{L} + \\
-3\begin{pmatrix} G_0^2(4 + 3P_{10}^2 + P_{20}^2) - 28Q_{10}^2 + 2(-10Q_{20}^2 + 3P_{20}^2(-3Q_{10}^2 + Q_{20}^2) + \\ -4P_{10}P_{20}Q_{10}Q_{20}(-6 + Q_{10}^2 + Q_{20}^2) + \\ P_{10}^2(2Q_{10}^4 - 19Q_{20}^2 + 6Q_{20}^4 + Q_{10}^2(-7 + 8Q_{20}^2))) \end{pmatrix}\cos\mathcal{L} + \\
-6\left(G_0^2 P_{20} - 4(P_{20}(4Q_{10}^2 - Q_{20}^2) + P_{10}Q_{10}Q_{20}(-4 + Q_{10}^2 + Q_{20}^2))\right)\cos\left(2\mathcal{L}\right) + \\
\begin{pmatrix} G_0^2(P_{10} - P_{20})(P_{10} + P_{20}) + Q_{10}^2(28 + 23P_{20}^2 + P_{10}^2(9 - 4Q_{10}^2)) + \\ 4P_{10}P_{20}(Q_{10} + 2Q_{10}^3)Q_{20} - (28 + 21P_{10}^2 + 11P_{20}^2)Q_{20}^2 + \\ 8P_{10}P_{20}Q_{10}Q_{20}^3 + 4P_{10}^2Q_{20}^4 \end{pmatrix}\cos\left(3\mathcal{L}\right) + \\
18\left(2P_{10}Q_{10}Q_{20} + P_{20}(Q_{10}^2 - Q_{20}^2)\right)\cos\left(4\mathcal{L}\right) + \\
3\left(P_{20}(Q_{10} - Q_{20}) + P_{10}(Q_{10} + Q_{20})\right)\left(P_{10}(Q_{20} - Q_{10}) + P_{20}(Q_{10} + Q_{20})\right)\cos\left(5\mathcal{L}\right) + \\
6\begin{pmatrix} G_0^2 P_{10}P_{20} - 2(2 + 5P_{20}^2)Q_{10}Q_{20} - 2P_{10}^2Q_{10}Q_{20}(-5 + 2Q_{10}^2 + 2Q_{20}^2) \\ +2P_{10}P_{20}(3Q_{10}^4 + Q_{20}^4 + 2Q_{10}^2(-5 + 2Q_{20}^2)) \end{pmatrix}\sin\left(\mathcal{L}\right) + \\
-6\left(G_0^2 P_{10} + 20P_{20}Q_{10}Q_{20} + 2P_{10}(-7Q_{20}^2 + Q_{20}^4 + Q_{10}^2 - Q_{10}^4)\right)\sin\left(2\mathcal{L}\right) + \\
-2\begin{pmatrix} G_0^2 P_{10}P_{20} + (28 + 17P_{20}^2)Q_{10}Q_{20} + P_{10}^2Q_{10}Q_{20}(15 - 4Q_{10}^2 - 4Q_{20}^2) \\ -P_{10}P_{20}(7Q_{10}^2 + 2Q_{10}^4 + 5Q_{20}^2 - 2Q_{20}^4) \end{pmatrix}\sin\left(3\mathcal{L}\right) + \\
18\left(-2P_{20}Q_{10}Q_{20} + P_{10}(Q_{10}^2 - Q_{20}^2)\right)\sin\left(4\mathcal{L}\right) + \\
6\left(P_{20}Q_{10} + P_{10}Q_{20}\right)\left(P_{10}Q_{10} - P_{20}Q_{20}\right)\sin\left(5\mathcal{L}\right)
\end{array}\right]_{L_0}^{L}
\tag{21}
$$

$$
I_{JQ1}\left(L_0, L, P_{10}, P_{20}\right) = -\left[\begin{array}{l}
6Q_{20}\mathcal{L} + \\
3\left(P_{20}Q_{10} - 3P_{10}Q_{20}\right)\cos\mathcal{L} + \\
3Q_{10}\cos\left(2\mathcal{L}\right) + \\
\left(P_{20}Q_{10} + P_{10}Q_{20}\right)\cos\left(3\mathcal{L}\right) + \\
3\left(-P_{10}Q_{10} + P_{20}Q_{20}\right)\sin\left(\mathcal{L}\right) + \\
-3Q_{20}\sin\left(2\mathcal{L}\right) + \\
\left(P_{10}Q_{10} - P_{20}Q_{20}\right)\sin\left(3\mathcal{L}\right)
\end{array}\right]_{L_0}^{L}
\tag{22}
$$

$$I_{JQ2}\left(L_0, L, P_{10}, P_{20}\right) = -\begin{bmatrix} -6Q_{10}\mathcal{L} + \\ 3\left(P_{10}Q_{10} - P_{20}Q_{20}\right)\cos\mathcal{L} + \\ -3Q_{20}\cos\left(2\mathcal{L}\right) + \\ \left(P_{10}Q_{10} - P_{20}Q_{20}\right)\cos\left(3\mathcal{L}\right) + \\ 3\left(-3P_{20}Q_{10} + P_{10}Q_{20}\right)\sin\left(\mathcal{L}\right) + \\ -3Q_{10}\sin\left(2\mathcal{L}\right) + \\ -\left(P_{20}Q_{10} + P_{10}Q_{20}\right)\sin\left(3\mathcal{L}\right) \end{bmatrix}_{L_0}^{L} \qquad [23]$$