

$$\left(-\frac{d^2}{d\zeta^2} + \lambda_B^2 \zeta^2 + 2\lambda_B(L_B + 1) + \frac{4L_B^2 - 1}{4\zeta^2}\right) \psi_J^+ = M^2 \psi_J^+,$$

$$\left(-\frac{d^2}{d\zeta^2} + \lambda_B^2 \zeta^2 + 2\lambda_B L_B + \frac{4(L_B + 1)^2 - 1}{4\zeta^2}\right) \psi_J^- = M^2 \psi_J^-.$$