$$\frac{d\varphi}{dt} = \frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + (\underbrace{\Delta + \Delta'}_{a})^2}} \times \frac{P_F P_0}{r^2 m_+} + \frac{P_F P_0}{r^2 m_-} + \frac{k}{2\pi r^2} \qquad (5\text{-}31)$$

$$\frac{d\varphi}{dt} = \frac{d\varphi}{dr} \times \frac{dr}{dt} = \frac{d\varphi}{dr}\left(\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + (\Delta + \Delta')^2}} \times \frac{P_r}{m_+} + \frac{P_r}{m_-}\right) \qquad (5\text{-}32)$$

$$\Rightarrow \frac{d\varphi}{dr} = \frac{\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + a^2}} \times P_F P_0 / r^2 m_+ + \frac{P_F P_0}{r^2 m_-} + k/2\pi r^2)}{\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + a^2}} \times \frac{P_r}{m_+} + \frac{P_r}{m_-}} \qquad (5\text{-}33)$$

$$\frac{d\varphi}{dr} = \frac{\frac{P_F P_0}{r^2}\left(\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + a^2}} \times \frac{1}{m_+} + \frac{1}{m_-}\right) + \frac{k}{2\pi r^2}}{P_F \left(1 - \frac{P_0^2}{r^2}\right)^{1/2}\left(\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + a^2}} \times \frac{1}{m_+} + \frac{1}{m_-}\right)} \qquad (5\text{-}34)$$

$$k = \frac{\pi h}{m}$$

$$\Rightarrow \frac{d\varphi}{dr} = \frac{P_0}{r^2 (1 - P_0^2/r^2)^{1/2}} + \frac{h}{2 r^2 m P_F \left(1 - \frac{P_0^2}{r^2}\right)\left(\frac{\varepsilon_p}{\sqrt{\varepsilon_p^2 + a^2}} \times \frac{1}{m_+} + \frac{1}{m_-}\right)} \qquad (5\text{-}35)$$

$$\varepsilon_p = \Delta_0 \sqrt{\frac{m_+}{m} \int_0 P_0 \pi \frac{(r^2 - r_{min}^2)}{r^2 r_{min}^2}} \quad , \quad \text{بسط تیلر}: \sqrt{\varepsilon_p^2 + \Delta^2} = \frac{\varepsilon_p^2}{2\Delta} + \Delta$$

$$a_0 = \Delta_0 + \Delta'$$

$$, \; 0 \approx \frac{\varepsilon_p^2}{2\Delta} \Leftarrow \varepsilon_p \ll \Delta \quad \text{در حد} \leftarrow$$

$$\Rightarrow \frac{d\varphi}{dr} = \frac{P_0}{r^2 (1 - P_0^2/r^2)^{1/2}} + \frac{h}{2 r^2 P_F \left(1 - \left(\frac{P_0}{r}\right)^2\right)^{1/2} \left[\left(\frac{m_+}{m} \int_0 P_0 \pi \left(\frac{r^2 - r_{min}^2}{r^2 r_{min}^2}\right)\right)^{1/2} \times \frac{\Delta_0}{m_+} \times \frac{1}{\Delta_0 + \Delta'} + \frac{1}{m_-}\right]} \qquad (5\text{-}36)$$