

1.
$$V(r) = D_e(1 - \frac{u(r)}{u(r_e)}e^{-\beta(r)y_p^{req}}) \quad (1)$$

2.
$$\beta(r) = (1 - y_p^{ref}(r)) \sum_{i=0}^{N_\beta} \beta_i y_q^{ref}(r)^i + y_p^{ref}(r) \beta_\infty \quad (2)$$

3.
$$y_n^{r_x}(r) = \frac{r^n - r_x^n}{r^n + r_x^n} \quad (3)$$

4.
$$\lim_{r \rightarrow \infty} \beta(r) = \beta_\infty \quad (4)$$

5.
$$\lim_{r \rightarrow \infty} y_n^{r_x} = 0 \quad (5)$$

6.
$$\lim_{r \rightarrow \infty} -\beta(r)y_p^{req}(r) = \infty \quad (6)$$