

irrotational flow

$$u = U - U \frac{(x_1^2 - y^2)(a^2 - z^2)}{(x_1^2 + y^2)^2}, \quad v = -U \frac{2x_1 y (a^2 - z^2)}{(x_1^2 + y^2)^2}, \quad w = 0 \quad (0 < z < a),$$

(1.15a)