$$
\begin{aligned}
x_2 &= x_1 - y_1^2(1 - \frac{y_1^2}{12\rho_b^2})\frac{p_1^2}{2\rho_b(p_1^2 - p_{x1}^2)^{3/2}}\,, \\
p_{y2} &= p_{y1} + p_{x1}(1 - \frac{y_1^2}{6\rho_b^2})\frac{y_1}{p_1\rho_b\sqrt{p_1^2 - p_{x1}^2}}\,, \\
z_2 &= z_1 + p_{x1}y_1^2(1 - \frac{y_1^2}{12\rho_b^2})\frac{p_1}{2\rho_b(p_1^2 - p_{x1}^2)^{3/2}}\,.
\end{aligned}
\tag{98}
$$