$T_{rev} = \frac{c}{v}$, $T_0 = \frac{c_0}{v_0}$, $dT = \frac{dT}{d\rho}\Big|_0 d\rho + \frac{1}{2}\frac{d^2T}{d\rho^2}\Big|_0 d\rho^2 + \cdots$; $\frac{dT}{T} = \frac{T - T_0}{T_0}$

$\frac{c - c_0}{c_0} = a_0\delta + a_1\delta^2 \rightarrow c = c_0(a_0\delta + a_1\delta^2) + c_0 \Rightarrow \frac{dc}{d\delta} = c_0(a_0 + 2a_1\delta)$

$\frac{\Delta V}{V} = \frac{\delta}{\beta^2} \rightarrow \frac{dV}{d\rho} = \frac{V}{\rho\beta^2}$; $\frac{d^2V}{d\rho^2} = \left(\frac{V}{\rho\beta^2}\right)\frac{1}{\rho\beta^2} - \frac{1}{\rho^2}\left(\frac{V}{\beta^2}\right) - \frac{2}{\beta^3}\left(\frac{V}{\rho}\right)\left(\frac{d\beta}{d\rho}\right)$ (=) $\frac{d\beta}{\beta} = \beta^2\frac{d\rho}{\rho} \rightarrow \frac{d\beta}{d\rho} = \beta^2\frac{\beta}{\rho}$ /

(=) $\frac{V}{\rho^2\beta^4} - \frac{V}{\rho^2\beta^2} - \frac{2V\beta^2}{\beta^2\rho^2} = \frac{V}{\rho^2}\left(\frac{1}{\beta^4} - \frac{1}{\beta^2} - 2\beta^2\right)$ ~~$\beta^2 = 1 - \frac{1}{\beta^2}$~~ ~~$= \frac{V}{\rho^2}\left(\frac{1}{\beta^4} - \frac{1}{\beta^2} - \frac{2}{\beta^2} + \frac{2}{\beta^4}\right)$~~

$\delta = \frac{\rho - \rho_0}{\rho_0} \rightarrow \frac{d\delta}{d\rho} = \frac{1}{\rho_0}$

$\frac{dT}{d\rho}\Big|_0 = \left(\frac{dc}{d\rho}\frac{1}{V}\right)\Big|_0 - \left(\frac{c}{V^2}(dV/d\rho)\right)\Big|_0 = c_0(a_0 + 2a_1\delta)\Big|_0^0 \frac{1}{\rho_0}\frac{1}{V_0} - \frac{c_0}{V_0^2}\frac{V_0}{\rho_0\beta_0^2} = c_0\left(\frac{a_0}{\rho_0 V_0} - \frac{1}{V_0\rho_0\beta_0^2}\right)$

$\frac{dT}{d\rho}\Big|_0 d\rho / T_0 = \left(a_0 - \frac{1}{\beta_0^2}\right)\delta$

$\frac{d^2T}{d\rho^2}\Big|_0 = \frac{d}{d\rho}\left(\frac{d}{d\rho}\left(\frac{c}{V}\right)\right)\Big|_0 = \frac{d}{d\rho}\left(\frac{dc}{d\rho}\frac{1}{V} - \frac{c}{V^2}\frac{dV}{d\rho}\right)\Big|_0 =$

$= \left(\frac{d^2c}{d\rho^2}\frac{1}{V}\right)\Big|_0 - 2\left(\frac{dc}{d\rho}\frac{1}{V^2}\frac{dV}{d\rho}\right)\Big|_0 + 2\left(\frac{c}{V^3}\left(\frac{dV}{d\rho}\right)^2\right)\Big|_0 - \left(\frac{c}{V^2}\frac{d^2V}{d\rho^2}\right)\Big|_0 =$

$\beta_0^2 = 1 - \frac{1}{\beta_0^2}$ /

$= \left(\frac{2a_1c_0}{\rho_0^2}\right)\frac{1}{V_0} - 2\left(\frac{c_0a_0}{\rho_0}\right)\frac{1}{V_0^2}\frac{V_0}{\rho_0\beta_0^2} + 2\left(\frac{c_0}{V_0^3}\frac{V_0^2}{\rho_0^2\beta_0^4}\right) - \left(\frac{c_0}{V_0^2}\frac{V_0}{\rho_0^2}\left(\frac{1}{\beta_0^4} - \frac{1}{\beta_0^2} - \frac{2\beta_0^2}{\beta_0^2}\right)\right) =$

$= \frac{2c_0}{\rho_0^2V_0}\left[a_1 - \frac{a_0}{\beta_0^2} + \frac{1}{\beta_0^4} - \frac{1}{2}\left(\frac{1}{\beta_0^4} - \frac{1}{\beta_0^2} - \frac{2}{\beta_0^2} + \frac{2}{\beta_0^4}\right)\right] =$

$= 2\frac{c_0}{V_0}\frac{1}{\rho_0^2}\left[a_1 - \frac{a_0}{\beta_0^2} + \frac{3}{2}\frac{1}{\beta_0^2} - \frac{1}{2\beta_0^4}\right]$

$\frac{d^2T}{d\rho^2}\Big|_0 \cdot \frac{1}{2}(d\rho)^2 \cdot \left(\frac{V_0}{c_0}\right) = \left[a_1 - \frac{a_0}{\beta_0^2} + \frac{3}{2}\frac{1}{\beta_0^2} - \frac{1}{2\beta_0^4}\right]\delta^2$

$\frac{dT}{T} = \left(a_0 - \frac{1}{\beta_0^2}\right)\delta + \left(a_1 - \frac{a_0}{\beta_0^2} + \frac{3}{2}\frac{1}{\beta_0^2} - \frac{1}{2\beta_0^4}\right)\delta^2$