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Abstract

1

$$\frac{dp_0^*}{dr} = \underbrace{-\frac{Gm_0(1+8\pi r^2 p)}{(r-2Gm)^2}}_{one} \underbrace{-\frac{4\pi G r^2(\epsilon+p)}{r-2Gm}\left(1-\frac{\sigma}{\epsilon+p}\right)p_0^*}_{two} + \underbrace{\frac{1}{12}\frac{r^4 j^2}{r-2Gm}\left(\frac{d\bar{\omega}}{dr}\right)^2}_{three} + \underbrace{\frac{1}{3}\frac{d}{dr}\left(\frac{r^3 j^2 \bar{\omega}^2}{r-2Gm}\right)}_{four}. \quad (1)$$

Note: Suku 'four' setelah diturunkan terhadap r menjadi

$$\frac{1}{3}\frac{\left[3r^2 j^2\bar{\omega}^2 + 2r^3\bar{\omega}^2 j\frac{dj}{dr} + 2r^3 j^2\bar{\omega}\frac{d\bar{\omega}}{dr}\right](r-2Gm) - \left[(r^3 j^2\bar{\omega}^2)(1-2G\frac{dm}{dr})\right]}{(r-2Gm)^2} \quad (2)$$

$$G\frac{dm_0}{dr} = \underbrace{4G\pi r^2\frac{d\epsilon}{dp}\left(1-\frac{d\sigma}{dp}\right)^{-1}(\epsilon+p)\left(1-\frac{\sigma}{\epsilon+p}\right)p_0^*}_{five} + \underbrace{\frac{1}{12}j^2 r^4\left(\frac{d\bar{\omega}}{dr}\right)^2}_{six} - \underbrace{\frac{1}{3}r^3\left(\frac{dj^2}{dr}\right)\bar{\omega}^2\left(1-\frac{\sigma}{\epsilon+p}\right)}_{seven}, \quad (3)$$

$$\frac{dh_2}{dr} = \underbrace{\left[-2\frac{d\nu}{dr} + \frac{r}{r-2Gm}\left(2\frac{d\nu}{dr}\right)^{-1}\left\{8G\pi(\epsilon+p)\left(1-\frac{\sigma}{\epsilon+p}\right)\left(1-\frac{d\sigma}{dp}\right)^{-1} - \frac{4Gm}{r^3}\right\}\right]}_{eight} \underbrace{\times h_2}_{(lanjutan)eight} \underbrace{-\frac{4v_2}{r(r-2Gm)}\left(2\frac{d\nu}{dr}\right)^{-1}}_{mnine} + \underbrace{\frac{1}{6}\left[\frac{1}{2}\times 2\frac{d\nu}{dr}r - \frac{1}{r-2Gm}\left(2\frac{d\nu}{dr}\right)^{-1}\right]r^3 j^2\left(\frac{d\bar{\omega}}{dr}\right)^2}_{ten}$$

$$\underbrace{-\frac{1}{3}\left[\left(1-\frac{6\sigma}{\epsilon+p}\right)\frac{1}{2}\times 2\frac{d\nu}{dr}r+\frac{1}{r-2Gm}\left(2\frac{d\nu}{dr}\right)^{-1}\left(1-\frac{\sigma}{\epsilon+p}\right)\left(1-\frac{d\sigma}{dp}\right)\right]}_{eleven}$$

$$\underbrace{\times r^2\left(\frac{dj^2}{dr}\right)\bar{\omega}^2}_{(lanjutan)eleven}. \tag{4}$$

$$\frac{dv_2}{dr}=\underbrace{-2\frac{d\nu}{dr}h_2}_{twelve}+\left(\frac{1}{r}+\frac{1}{2}\times 2\frac{d\nu}{dr}\right)\left[-\left(\frac{1}{3}-\underbrace{\frac{2\sigma}{\epsilon+p}}_{thirteen}\right)r^3\frac{dj^2}{dr}\bar{\omega}^2+\underbrace{\frac{1}{6}j^2r^4\left(\frac{d\bar{\omega}}{dr}\right)^2}_{fourteen}\right], \tag{5}$$

Persamaan-persamaan pendukung:

$$j=e^{-\nu}\left[1-\frac{2Gm(r)}{r}\right]^{1/2} \tag{6}$$

$$j^2=e^{-2\nu}\left[1-\frac{2Gm(r)}{r}\right] \tag{7}$$

$$\frac{dj}{dr}=-4\pi Gr(\epsilon+p)e^{-\nu}\left[1-\frac{2Gm(r)}{r}\right]^{-1/2} \tag{8}$$

$$\frac{dj^2}{dr}-8\pi Gre^{-2\nu}(\epsilon+p) \tag{9}$$

$$\frac{d\nu}{dr}=G\frac{8\pi pr^3+2m}{r(r-2Gm)} \tag{10}$$

$$p_2*=-h_2-\frac{1}{3}r^2e^{-2\nu}\bar{\omega}^2 \tag{11}$$