برای قرص خواهیم داشت:

پایستگی جرم $(V^z = 0)$:

$$V^R \frac{\partial}{\partial R}\left(R^{3/2} - KR^{5/2}\right) + \left(R^{3/2} + KR^{5/2}\right)\left(\frac{\partial V^R}{\partial R}\right) = -\left(R^{3/2} + KR^{5/2}\right)\left[\left\{V^R\left(\left[\Gamma^R_{RR} + \Gamma^\varphi_{\varphi R} + \Gamma^z_{zR}\right] - \Gamma^0_{r0}\right)\right\} + \left\{V^R\left(\left[\Gamma^r_{rz} + \Gamma^\varphi_{\varphi z} + \Gamma^z_{zz}\right] - \Gamma^0_{z0}\right)\right\} - \left\{\Gamma^0_{R\varphi} V^\varphi V^R + \Gamma^0_{\varphi R} V^R V^\varphi\right\}\right] - \frac{1}{(u^0)^2}\left[-2\left\{-B_\varphi J^z u^R u^0\right\}\right]$$

پایستگی تکانه شعاعی:

$$\left(R^{3/2} + KR^{5/2}\right)(u^0)^2 \frac{\partial V^R}{\partial R} V^R + \left[1 + \frac{2m}{\sqrt{R^2 + z^2}}\right]\frac{\partial (KR^{5/2})}{\partial R} = -\left(R^{3/2} + KR^{5/2}\right)(u^0)^2\left[(\Gamma^R_{00}) - 2\Gamma^0_{0R} V^R V^R + 2V^\varphi \Gamma^R_{0\varphi} + V^t V^R(\Gamma^t_{Rt} - \Gamma^0_{Rt} V^R) + V^R V^R \Gamma^R_{RR} - \Gamma^0_{\varphi R} V^R V^R V^\varphi - \Gamma^0_{R\varphi} V^R V^\varphi V^R + V^\varphi V^\varphi \Gamma^R_{\varphi\varphi}\right] - \left[B_\varphi J^z\right]$$

پایستگی تکانه زاویه ای:

$$\left(R^{3/2} + KR^{5/2}\right)(u^0)^2 \frac{\partial V^\varphi}{\partial R} V^R = -\left(R^{3/2} + KR^{5/2}\right)(u^0)^2\left[2V^R\left(\Gamma^\varphi_{tR} - \Gamma^t_{tR} V^\varphi\right) + V^t V^R\left(\Gamma^\varphi_{Rt} - \Gamma^t_{Rt} V^\varphi\right) + V^R V^\varphi\left(\Gamma^\varphi_{\varphi R} - \Gamma^t_{\varphi R} V^\varphi\right) + V^\varphi V^R\left(\Gamma^\varphi_{R\varphi} - \Gamma^t_{R\varphi} V^\varphi\right)\right]$$

پایستگی تکانه ارتفاعی:

$$as\ J^R = 0\ ,\ \frac{\partial}{\partial z} = 0\ \ ,\ \ V^z = 0\ \ \rightarrow\ \ 0 = 0$$

برای قرص:

$$(u^0)^2 = \left[1 - \frac{2m}{\sqrt{R^2}} + 2\frac{2ma}{R} V^\varphi + \left[-\left(1 + \frac{2m}{R}\right)(V^R)^2 - R^2\left(1 + \frac{2m}{R}\right)(V^\varphi)^2\right]\right]^{-1}$$

همینطور برای J در قرص داریم:

$$-\frac{4\pi}{c} J^z = \frac{\partial}{\partial R}\left[\left(\frac{R^2}{R^2 + 2mR + 4m^2}\right) B_\varphi(R)\right] + B_\varphi\left(\frac{mR(R^5 + 2R^4 m - 2R^2 a^2 m)}{R^2(R^6 - 4R^4 m^2 + 4R^2 a^2 m^2)} - \frac{m}{R(R + 2m)} - \frac{m}{R(R + 2m)}\frac{R^3 m - R^4 + 2R^2 m^2 + 2a^2 m^2}{(R^4 - 4R^2 m^2 + 4a^2 m^2)}\right)\left(\frac{R^2}{R^2 + 2mR + 4m^2}\right)$$

سپس برای جت خواهیم داشت:

پایستگی جرم:

$$V^z\frac{\partial}{\partial z}\left(z^{3/2}-Kz^{5/2}\right)+\left(z^{3/2}+Kz^{5/2}\right)\left(\frac{\partial V^z}{\partial z}\right)$$
$$=-\left(z^{3/2}+Kz^{5/2}\right)\left[-\left\{\Gamma^0_{\varphi z}V^zV^\varphi+\Gamma^0_{z\varphi}V^\varphi V^z\right\}\right]-\frac{1}{(u^0)^2}\left[-2\{-B_zJ^Ru^\varphi u^0\}\right]$$

پایستگی تکانه شعاعی:

$$\left[1+\frac{2m}{z}\right]\frac{\partial(Kz^{5/2})}{\partial R}=-\left(z^{3/2}+Kz^{5/2}\right)(u^0)^2\left[(\Gamma^R_{00})+2V^\varphi\Gamma^R_{0\varphi}+V^tV^z(\Gamma^t_{zt})+V^\varphi V^\varphi\Gamma^R_{\varphi\varphi}+V^zV^z\Gamma^R_{zz}\right]+B_zJ^\varphi$$

پایستگی تکانه زاویه ای:

$$\left(z^{3/2}+Kz^{5/2}\right)(u^0)^2\frac{\partial V^\varphi}{\partial z}V^z$$
$$=-\left(z^{3/2}+Kz^{5/2}\right)(u^0)^2\left[2V^z\left(\Gamma^\varphi_{tz}-\Gamma^t_{tz}V^\varphi\right)+V^tV^z\left(\Gamma^\varphi_{zt}-\Gamma^t_{zt}V^\varphi\right)+V^\varphi V^z\left(\Gamma^\varphi_{z\varphi}-\Gamma^t_{z\varphi}V^\varphi\right)\right.$$
$$\left.+V^zV^\varphi\left(\Gamma^\varphi_{\varphi z}-\Gamma^t_{\varphi z}V^\varphi\right)\right]-B_zJ^R$$

پایستگی تکانه ارتفاعی:

$$\left(z^{3/2}+Kz^{5/2}\right)(u^0)^2\frac{\partial V^z}{\partial z}V^z+\left[1+\frac{2m}{z}\right]\frac{\partial(Kz^{5/2})}{\partial z}$$
$$=-\left(z^{3/2}+Kz^{5/2}\right)(u^0)^2\left[\Gamma^z_{tt}+2V^\varphi\Gamma^z_{t\varphi}-2\Gamma^t_{tz}V^zV^z+V^tV^\varphi\Gamma^z_{\varphi t}-V^tV^z\Gamma^t_{zt}V^z+V^\varphi V^\varphi\Gamma^z_{\varphi\varphi}\right.$$
$$\left.-\Gamma^t_{z\varphi}V^zV^\varphi V^z-\Gamma^t_{\varphi z}V^zV^zV^\varphi+V^zV^z\Gamma^z_{zz}\right]$$

همینطور برای J در جت داریم (تنها آن هایی که استفاده دارند را نوشتیم) :

$$-\frac{4\pi}{c}J^R=B_\varphi\left\{\frac{\partial}{\partial z}\left[-\frac{z^2}{(z^2+2m)^2}\right]\right.$$
$$+\left(-\frac{mz(z+2z^3+z^5-2m+6a^2m-4mz^2-2mz^4)}{(1-4m^2+3z^2+4a^2m^2-8m^2z^2+3z^4-4m^2z^4+z^6)}-\frac{m}{z(z+2m)}\right.$$
$$\left.\left.-\frac{mz}{(1+z^2)(\sqrt{z}+2m)}\right)\left(-\frac{z^2}{(z^2+2m)^2}\right)\right\}$$

$$-\frac{4\pi}{c}J^\varphi=-B_z\left\{\frac{am(z-2z^3+4mz^2)}{(1-4m^2+3z^2+4a^2m^2-8m^2z^2+3z^4-4m^2z^4+z^6)}\left(\frac{z^4}{2ma(z+2m)}\right)+\left(-\frac{m}{z^2(z+2m)}\right.\right.$$
$$-(2mz^3+4z^5m+2z^7m-mz-4z^3m-5z^5m-2z^7m-1+2m^2-4z^2+2a^2m^2$$
$$+8m^2z^2-6z^4-4a^2m^2z^2+10m^2z^4-4z^6+4m^2z^6$$
$$-z^8)/((1+z^2)(1-4m^2+3z^2+4a^2m^2-8m^2z^2+3z^4-4m^2z^4+z^6))$$
$$\left.\left.-\frac{m}{(1+z^2)(z+2m)}\right)\left(\frac{z^2}{(z+2m)^2}\right)\right\}$$

برای جت:

$$(u^0)^2=\left[1-\frac{2m}{z}+2\frac{2ma}{z^3}V^\varphi+\left[-\left(1+\frac{2m}{z}\right)(V^\varphi)^2-\left(1+\frac{2m}{z}\right)(V^z)^2\right]\right]^{-1}$$