برای قرص خواهیم داشت:

پایستگی جرم $(V^z=0)$ **:**

$$V^R\frac{\partial}{\partial R}\left(R^{3/2}-K R^{5/2}\right)+\left(R^{3/2}+K R^{5/2}\right)\left(\frac{\partial V^R}{\partial R}\right)=-\left(R^{3/2}+K R^{5/2}\right)\left[\left\{V^R\left(\left[\Gamma^R_{RR}+\Gamma^\varphi_{\varphi R}+\Gamma^z_{zR}\right]-\Gamma^0_{r\,0}\right)\right\}+\left\{V^R\left(\left[\Gamma^r_{rz}+\Gamma^\varphi_{\varphi z}+\Gamma^z_{zz}\right]-\right.\right.$$

پایستگی تکانه شعاعی:

$$\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\frac{\partial V^R}{\partial R}V^R+\left[1+\frac{2m}{\sqrt{R^2+z^2}}\right]\frac{\partial\left(K R^{5/2}\right)}{\partial R}=-\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\left[\left(\Gamma^R_{00}\right)-2\Gamma^0_{0R}V^RV^R+2V^\varphi\Gamma^R_{0\varphi}\right.$$

پایستگی تکانه زاویه ای:

$$-\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\left[2V^R\left(\Gamma^\varphi_{tR}-\Gamma^t_{tR}V^\varphi\right)+V^tV^R\left(\Gamma^\varphi_{Rt}-\Gamma^t_{Rt}V^\varphi\right)+V^RV^\varphi\left(\Gamma^\varphi_{\varphi R}-\Gamma^t_{\varphi R}V^\varphi\right)+V^\varphi V^R\left(\Gamma^\varphi_{R\varphi}-\Gamma^t_{R\varphi}V^\varphi\right)\right]¿¿$$

پایستگی تکانه ارتفاعی:

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

همینطور برای J در قرص داریم:

$$_\varphi(R)\Big]+B_\varphi\left(\frac{mR\left(R^5+2R^4m-2R^2a^2m\right)}{R^2\left(R^6-4R^4m^2+4R^2a^2m^2\right)}-\frac{m}{R(R+2m)}-\frac{m}{R(R+2m)}\frac{R^3m-R^4+2R^2m^2+2a^2m^2}{\left(R^4-4R^2m^2+4a^2m^2\right)}\right)\left(\frac{R^2}{R^2+2mR+4m^2}\right)$$

$$(R)\Big]+B_\varphi\left(\frac{mR\left(R^5+2R^4m-2R^2a^2m\right)}{R^2\left(R^6-4R^4m^2+4R^2a^2m^2\right)}-\frac{m}{R(R+2m)}-\frac{m}{R(R+2m)}\frac{R^3m-R^4+2R^2m^2+2a^2m^2}{\left(R^4-4R^2m^2+4a^2m^2\right)}\right)\left(\frac{R^2}{R^2+2mR+4m^2}\right)\Bigg\}$$

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

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

$$J^z\approx-\left\{\frac{B_\varphi(R)}{R}+\frac{\partial B_\varphi(R)}{\partial R}+B_\varphi\left(\frac{1}{R^2}-\frac{m}{R(R+2m)}-\frac{m}{R(R+2m)}\frac{R^3m-R^4+2R^2m^2+2a^2m^2}{\left(R^4-4R^2m^2+4a^2m^2\right)}\right)\right\}$$

$$J^z\approx-\left\{\frac{B_\varphi(R)}{R}+\frac{\partial B_\varphi(R)}{\partial R}+\frac{B_\varphi}{R^2}\right\}=\frac{-\partial B_\varphi}{\partial R}-B_\varphi\left(\frac{1}{R}+\frac{1}{R^2}\right)$$

پایستگی جرم :

$$V^R\frac{\partial}{\partial R}\left(R^{3/2}-K R^{5/2}\right)+\left(R^{3/2}+K R^{5/2}\right)\left(\frac{\partial V^R}{\partial R}\right)=-\left(R^{3/2}+K R^{5/2}\right)\left[\left\{V^R\left(\left[\Gamma^R_{RR}+\Gamma^\varphi_{\varphi R}+\Gamma^z_{zR}\right]-\Gamma^0_{r\,0}\right)\right\}+\left\{V^R\left(\left[\Gamma^r_{rz}+\Gamma^\varphi_{\varphi z}+\Gamma^z_{zz}\right]-\right.\right.$$

$$\frac{\partial V^R}{\partial R}=\frac{1}{4R}¿$$

پایستگی تکانه شعاعی:

$$\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\frac{\partial V^R}{\partial R}V^R+\left[1+\frac{2m}{\sqrt{R^2+z^2}}\right]\frac{\partial\left(K R^{5/2}\right)}{\partial R}=-\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\left[\left(\Gamma^R_{00}\right)-2\Gamma^0_{0R}V^RV^R+2V^\varphi\Gamma^R_{0\varphi}\right.$$

$$B_\varphi\left[\frac{-\partial B_\varphi}{\partial R}-B_\varphi\left(\frac{1}{R}+\frac{1}{R^2}\right)\right]\left(1+2u^Ru^0\right)=¿-\left(R^{\frac{3}{2}}+K R^{\frac{5}{2}}\right)(u¿¿0)^2\left[\left(\Gamma^R_{00}\right)-2\Gamma^0_{0R}V^RV^R+2V^\varphi\Gamma^R_{0\varphi}+V^tV^R\left(\Gamma^t_{Rt}-\Gamma^0_{Rt}V^R\right.\right.$$

$$\frac{\partial B_\varphi}{\partial R}=\frac{1}{B_\varphi\left(1+2u^Ru^0\right)}¿$$

پایستگی تکانه زاویه ای:

$$-\left(R^{3/2}+K R^{5/2}\right)(u¿¿0)^2\left[2V^R\left(\Gamma^\varphi_{tR}-\Gamma^t_{tR}V^\varphi\right)+V^tV^R\left(\Gamma^\varphi_{Rt}-\Gamma^t_{Rt}V^\varphi\right)+V^RV^\varphi\left(\Gamma^\varphi_{\varphi R}-\Gamma^t_{\varphi R}V^\varphi\right)+V^\varphi V^R\left(\Gamma^\varphi_{R\varphi}-\Gamma^t_{R\varphi}V^\varphi\right)\right]¿¿$$