Schwarzschild Metric in spherical coordinates with a variable spherically symmetric matter density:

$\boxed{x^\mu}$

$x^0 = t.$
$x^1 = r.$
$x^2 = \theta.$
$x^3 = \phi.$

$\boxed{g_{\mu\nu}}$

$g_{00} = \frac{r-2m}{r}.$
$g_{01} = 0.$
$g_{02} = 0.$
$g_{03} = 0.$
$g_{10} = 0.$
$g_{11} = -\frac{r}{r-2m}.$
$g_{12} = 0.$
$g_{13} = 0.$
$g_{20} = 0.$
$g_{21} = 0.$
$g_{22} = -r^2.$
$g_{23} = 0.$
$g_{30} = 0.$
$g_{31} = 0.$
$g_{32} = 0.$
$g_{33} = -r^2\sin(\theta)^2.$

$\boxed{\sqrt{} = \sqrt{-\det(g_{\mu\nu})}}$

$\sqrt{} = \sqrt{r^4\sin(\theta)^2}.$

$\boxed{g^{\mu\nu}}$

$g^{00} = \frac{r}{r-2m}.$
$g^{01} = 0.$
$g^{02} = 0.$
$g^{03} = 0.$
$g^{10} = 0.$
$g^{11} = -\frac{r-2m}{r}.$
$g^{12} = 0.$
$g^{13} = 0.$
$g^{20} = 0.$
$g^{21} = 0.$
$g^{22} = -\frac{1}{r^2}.$
$g^{23} = 0.$
$g^{30} = 0.$
$g^{31} = 0.$
$g^{32} = 0.$
$g^{33} = -\frac{1}{r^2\sin(\theta)^2}.$

$\boxed{\Gamma^{\sigma}_{\mu\nu}}$

$\Gamma^0_{00} = 0.$
$\Gamma^0_{01} = \frac{m}{(r-2m)r}.$
$\Gamma^0_{02} = 0.$
$\Gamma^0_{03} = 0.$
$\Gamma^0_{10} = \frac{m}{(r-2m)r}.$
$\Gamma^0_{11} = 0.$
$\Gamma^0_{12} = 0.$
$\Gamma^0_{13} = 0.$
$\Gamma^0_{20} = 0.$
$\Gamma^0_{21} = 0.$
$\Gamma^0_{22} = 0.$
$\Gamma^0_{23} = 0.$
$\Gamma^0_{30} = 0.$
$\Gamma^0_{31} = 0.$
$\Gamma^0_{32} = 0.$
$\Gamma^0_{33} = 0.$

$\Gamma^1_{00} = \frac{(r-2m)m}{r^3}.$
$\Gamma^1_{01} = 0.$
$\Gamma^1_{02} = 0.$
$\Gamma^1_{03} = 0.$
$\Gamma^1_{10} = 0.$
$\Gamma^1_{11} = -\frac{m}{(r-2m)r}.$
$\Gamma^1_{12} = 0.$
$\Gamma^1_{13} = 0.$
$\Gamma^1_{20} = 0.$
$\Gamma^1_{21} = 0.$
$\Gamma^1_{22} = -r+2m.$
$\Gamma^1_{23} = 0.$
$\Gamma^1_{30} = 0.$
$\Gamma^1_{31} = 0.$
$\Gamma^1_{32} = 0.$
$\Gamma^1_{33} = -(r-2m)\sin(\theta)^2.$

$\Gamma^{2}_{00} = 0.$
$\Gamma^{2}_{01} = 0.$
$\Gamma^{2}_{02} = 0.$
$\Gamma^{2}_{03} = 0.$
$\Gamma^{2}_{10} = 0.$
$\Gamma^{2}_{11} = 0.$
$\Gamma^{2}_{12} = \frac{1}{r}.$
$\Gamma^{2}_{13} = 0.$
$\Gamma^{2}_{20} = 0.$
$\Gamma^{2}_{21} = \frac{1}{r}.$
$\Gamma^{2}_{22} = 0.$
$\Gamma^{2}_{23} = 0.$
$\Gamma^{2}_{30} = 0.$
$\Gamma^{2}_{31} = 0.$
$\Gamma^{2}_{32} = 0.$
$\Gamma^{2}_{33} = -\cos(\theta)\sin(\theta).$

$\Gamma^{3}_{00} = 0.$
$\Gamma^{3}_{01} = 0.$
$\Gamma^{3}_{02} = 0.$
$\Gamma^{3}_{03} = 0.$
$\Gamma^{3}_{10} = 0.$
$\Gamma^{3}_{11} = 0.$
$\Gamma^{3}_{12} = 0.$
$\Gamma^{3}_{13} = \frac{1}{r}.$
$\Gamma^{3}_{20} = 0.$
$\Gamma^{3}_{21} = 0.$
$\Gamma^{3}_{22} = 0.$
$\Gamma^{3}_{23} = \frac{\cos(\theta)}{\sin(\theta)}.$
$\Gamma^{3}_{30} = 0.$
$\Gamma^{3}_{31} = \frac{1}{r}.$
$\Gamma^{3}_{32} = \frac{\cos(\theta)}{\sin(\theta)}.$
$\Gamma^{3}_{33} = 0.$

$\boxed{\ddot{x}^{\mu} = \left(\Gamma^{0}_{\sigma\rho}\dot{x}^{\mu} - \Gamma^{\mu}_{\sigma\rho}\right)\dot{x}^{\sigma}\dot{x}^{\rho}}$

$\ddot{x}^{0} = 0.$
$$\ddot{x}^{1} = \frac{4r^3m^2\dot{z}^2\sin(\theta)^2 + 4rm^2 + 3\dot{x}^2r^2m - 4r^4m\dot{z}^2\sin(\theta)^2 - 4m^3 - r^2m + r^5\dot{z}^2\sin(\theta)^2}{(r-2m)r^3}.$$
$\ddot{x}^{2} = \cos(\theta)\dot{z}^2\sin(\theta).$
$\ddot{x}^{3} = -2\frac{\dot{x}r\dot{z} - 3\dot{x}m\dot{z}}{(r-2m)r}.$

$\boxed{g^{\mu\nu}\,\Gamma^{\lambda}_{\mu\nu} = 0?}$

$g^{\mu\nu}\,\Gamma^{0}_{\mu\nu} = 0.$
$$g^{\mu\nu}\,\Gamma^{1}_{\mu\nu} = -6\frac{r^4m\sin(\theta)^4}{(r-2m)^2} - 8\frac{m^2}{(r-2m)^2r} + \frac{r^5\sin(\theta)^4}{(r-2m)^2} + 12\frac{r^3m^2\sin(\theta)^4}{(r-2m)^2} + 12\frac{r^3m^2}{(r-2m)^2} - 8\frac{r^2m^3}{(r-2m)^2} + 2\frac{m}{(r-2m)^2} - 32\frac{m^4}{(r-2m)^2r^3} + 16\frac{m^5}{(r-2m)^2r^4} + \frac{r^5}{(r-2m)^2} - 6\frac{r^4m}{(r-2m)^2} + 24\frac{m^3}{(r-2m)^2r^2} - 8\frac{r^2m^3\sin(\theta)^4}{(r-2m)^2}.$$
$g^{\mu\nu}\,\Gamma^{2}_{\mu\nu} = \cos(\theta)r^2\sin(\theta)^3.$
$g^{\mu\nu}\,\Gamma^{3}_{\mu\nu} = 0.$