============== Title

Spherically symmetric line element

============== Coordinates x[0], x[1], x[2], x[3] =

$$t$$

$$r$$

$$\vartheta$$

$$\varphi$$

============== Metric g =

$$\begin{pmatrix} \frac{\mu}{r}+1 & 0 & 0 & 0 \\ 0 & \frac{1}{\frac{\mu}{r}+1} & 0 & 0 \\ 0 & 0 & r^2 & 0 \\ 0 & 0 & 0 & r^2 \sin^2 \vartheta \end{pmatrix}$$

============== Contravariant Metric gContr =

$$\begin{pmatrix} \frac{r}{r+\mu} & 0 & 0 & 0 \\ 0 & \frac{r+\mu}{r} & 0 & 0 \\ 0 & 0 & \frac{1}{r^2} & 0 \\ 0 & 0 & 0 & \frac{1}{r^2 \sin^2 \vartheta} \end{pmatrix}$$

============== Christoffel Connection Gamma

$\Gamma[0,0,1] =$

$$-\frac{\mu}{2\, r\, (r+\mu)}$$

$\Gamma[0,1,0] =$

$$-\frac{\mu}{2\, r\, (r+\mu)}$$

$\Gamma[1,0,0] =$

$$\frac{\mu\, (r+\mu)}{2\, r^3}$$

$\Gamma[1,1,1] =$

$$\frac{\mu}{2\, r\, (r+\mu)}$$

$\Gamma[1,2,2] =$

$$-(r+\mu)$$

$\Gamma[1,3,3] =$

$$-(r+\mu)\, \sin^2 \vartheta$$

$\Gamma[2,1,2] =$

$$\frac{1}{r}$$

$\Gamma[2,2,1] =$

$$\frac{1}{r}$$

$\Gamma[2,3,3] =$

$$-\cos\vartheta\,\sin\vartheta$$

$\Gamma[3,1,3] =$

$$\frac{1}{r}$$

$\Gamma[3,2,3] =$

$$\frac{\cos\vartheta}{\sin\vartheta}$$

$\Gamma[3,3,1] =$

$$\frac{1}{r}$$

$\Gamma[3,3,2] =$

$$\frac{\cos\vartheta}{\sin\vartheta}$$

============== Metric compatibility
============== o.k.

============== Riemann Tensor
R[0,1,0,1] =

$$-\frac{\mu}{r^2\,(r+\mu)}$$

R[0,1,1,0] =

$$\frac{\mu}{r^2\,(r+\mu)}$$

R[0,2,0,2] =

$$\frac{\mu}{2\,r}$$

R[0,2,2,0] =

$$-\frac{\mu}{2\,r}$$

R[0,3,0,3] =

$$\frac{\mu\,\sin^2\vartheta}{2\,r}$$

R[0,3,3,0] =

$$-\frac{\mu\,\sin^2\vartheta}{2\,r}$$

R[1,0,0,1] =

$$\frac{\mu\,(r+\mu)}{r^4}$$

R[1,0,1,0] =

$$-\frac{\mu\,(r+\mu)}{r^4}$$

R[1,2,1,2] =

$$\frac{\mu}{2\,r}$$

R[1,2,2,1] =

$$-\frac{\mu}{2\,r}$$

R[1,3,1,3] =

$$\frac{\mu \sin^2 \vartheta}{2\,r}$$

R[1,3,3,1] =

$$-\frac{\mu \sin^2 \vartheta}{2\,r}$$

R[2,0,0,2] =

$$-\frac{\mu\ (r+\mu)}{2\,r^4}$$

R[2,0,2,0] =

$$\frac{\mu\ (r+\mu)}{2\,r^4}$$

R[2,1,1,2] =

$$-\frac{\mu}{2\,r^2\ (r+\mu)}$$

R[2,1,2,1] =

$$\frac{\mu}{2\,r^2\ (r+\mu)}$$

R[2,3,2,3] =

$$-\frac{\mu \sin^2 \vartheta}{r}$$

R[2,3,3,2] =

$$\frac{\mu \sin^2 \vartheta}{r}$$

R[3,0,0,3] =

$$-\frac{\mu\ (r+\mu)}{2\,r^4}$$

R[3,0,3,0] =

$$\frac{\mu\ (r+\mu)}{2\,r^4}$$

R[3,1,1,3] =

$$-\frac{\mu}{2\,r^2\ (r+\mu)}$$

R[3,1,3,1] =

$$\frac{\mu}{2\,r^2\ (r+\mu)}$$

R[3,2,2,3] =

$$\frac{\mu}{r}$$

R[3,2,3,2] =

$$-\frac{\mu}{r}$$

============= Ricci Tensor
============= all elements zero

============= Ricci Scalar

$R_{sc} =$

$$0$$

============== Bianchi identity (Ricci cyclic equation $R \wedge q = 0$)
============== o.k.

============== Einstein tensor
============== all elements zero

============== Bianchi identity of Hodge dual
============== (see charge and current densities)

============== Scalar charge density
$\rho =$

$$0$$

============== Current density class 1
J[1] =

$$0$$

J[2] =

$$0$$

J[3] =

$$0$$

============== Current density class 2
J[1] =

$$0$$

J[2] =

$$0$$

J[3] =

$$0$$

============== Current density class 3
J[1] =

$$0$$

J[2] =

$$0$$

J[3] =

$$0$$