

# Metric tensor coefficients (dd)

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$$2 \cdot G \cdot M$$

$$g_{00} = - \frac{2 \cdot G \cdot M}{c \cdot r} + 1$$

$$g_{01} = 0$$

$$g_{02} = 0$$

$$g_{03} = 0$$

$$g_{10} = 0$$

$$-1$$

$$g_{11} = - \frac{2 \cdot G \cdot M}{c \cdot r} + 1$$

$$2 \cdot G \cdot M$$

$$- \frac{2 \cdot G \cdot M}{c \cdot r} + 1$$

$$c \cdot r$$

$$g_{12} = 0$$

$$g_{13} = 0$$

$$g_{20} = 0$$

$$g_{21} = 0$$

$$2$$

$$g_{22} = -r$$

$$g_{23} = 0$$

$$g_{30} = 0$$

$$g_{31} = 0$$

$$g_{32} = 0$$

$$2 \quad 2$$

$$g_{33} = -r \cdot \sin^2(\theta)$$

## Connection coefficients (udd)

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$$\Gamma^0_{00} = 0$$

$$G \cdot M$$

$$\Gamma^0_{01} = \frac{G \cdot M}{r^2 \cdot (-2 \cdot G \cdot M + c \cdot r)}$$

$$\Gamma^0_{02} = 0$$

$$\Gamma^0_{03} = 0$$

$$G \cdot M$$

$$\Gamma^0_{10} = \frac{G \cdot M}{r^2 \cdot (-2 \cdot G \cdot M + c \cdot r)}$$

$$\Gamma^0_{11} = 0$$

$$\Gamma^0_{12} = 0$$

$$\Gamma^0_{13} = 0$$

$$\Gamma^0_{20} = 0$$

$$\Gamma^0_{21} = 0$$

$$\Gamma^0_{22} = 0$$

$$\Gamma^0_{23} = 0$$

$$\Gamma^0_{30} = 0$$

$$\Gamma_{31}^0 = 0$$

$$\Gamma_{32}^0 = 0$$

$$\Gamma_{33}^0 = 0 \left( \frac{G \cdot M}{c \cdot r} \right) - 2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) \dots$$

$$\Gamma_{00}^1 = \frac{2 \cdot \frac{G \cdot M}{c \cdot r}}{2 \cdot \frac{G \cdot M}{c \cdot r}}$$

$$\Gamma_{01}^1 = 0$$

$$\Gamma_{02}^1 = 0$$

$$\Gamma_{03}^1 = 0$$

$$\Gamma_{10}^1 = 0 \left( \frac{G \cdot M}{c \cdot r} \right) + 2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) \dots$$

$$\Gamma_{11}^1 = \frac{2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) + 1}{2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) + 1}$$

$$\Gamma_{12}^1 = 0$$

$$\Gamma_{13}^1 = 0$$

$$\Gamma_{20}^1 = 0$$

$$\Gamma_{21}^1 = 0 \left( \frac{G \cdot M}{c \cdot r} \right) + 2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) \dots$$

$$\Gamma_{22}^1 = 2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) \dots$$

$$\Gamma_{23}^1 = 0$$

$$\Gamma_{30}^1 = 0$$

$$\Gamma_{31}^1 = 0$$

$$\Gamma_{32}^1 = 0 \left( \frac{G \cdot M}{c \cdot r} \right) + 2 \cdot \frac{G \cdot M}{c \cdot r} \left( \frac{1}{2} \right) \dots \cdot \sin(\theta)$$

$$\Gamma_{00}^2 = 0$$

$$\Gamma_{01}^2 = 0$$

$$\Gamma_{02}^2 = 0$$

$$\Gamma_{03}^2 = 0$$

$$\Gamma_{10}^2 = 0$$

$$\Gamma_{11}^2 = 0$$

$$\Gamma_{12}^2 = -\frac{1}{r}$$

$$\Gamma_{13}^2 = 0$$

$$\Gamma_{20}^2 = 0$$

$$\begin{aligned}
&1 \\
\Gamma_{21}^2 &= - \\
&r \\
\Gamma_{22}^2 &= 0 \\
\Gamma_{23}^2 &= 0 \\
\Gamma_{30}^2 &= 0 \\
\Gamma_{31}^2 &= 0 \\
\Gamma_{32}^2 &= 0 \\
\Gamma_{33}^2 &= -\sin(\theta) \cdot \cos(\theta) \\
\Gamma_{00}^3 &= 0 \\
\Gamma_{01}^3 &= 0 \\
\Gamma_{02}^3 &= 0 \\
\Gamma_{03}^3 &= 0 \\
\Gamma_{10}^3 &= 0 \\
\Gamma_{11}^3 &= 0 \\
\Gamma_{12}^3 &= 0 \\
&1 \\
\Gamma_{13}^3 &= - \\
&r \\
\Gamma_{20}^3 &= 0 \\
\Gamma_{21}^3 &= 0 \\
\Gamma_{22}^3 &= 0 \\
&\cos(\theta) \\
\Gamma_{23}^3 &= \frac{\cos(\theta)}{\sin(\theta)} \\
&\sin(\theta) \\
\Gamma_{30}^3 &= 0 \\
&1 \\
\Gamma_{31}^3 &= - \\
&r \\
&\cos(\theta) \\
\Gamma_{32}^3 &= \frac{\cos(\theta)}{\sin(\theta)} \\
&\sin(\theta) \\
\Gamma_{33}^3 &= 0
\end{aligned}$$

Riemann curvature tensor coefficients (uddd)

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$$\begin{aligned}
R_{000}^0 &= 0 \\
R_{001}^0 &= 0 \\
R_{002}^0 &= 0 \\
R_{003}^0 &= 0 \\
R_{010}^0 &= 0 \\
R_{011}^0 &= 0 \\
R_{012}^0 &= 0 \\
R_{013}^0 &= 0 \\
R_{020}^0 &= 0 \\
R_{021}^0 &= 0 \\
R_{022}^0 &= 0 \\
R_{023}^0 &= 0 \\
R_{030}^0 &= 0 \\
R_{031}^0 &= 0
\end{aligned}$$

$$R^0_{032} = 0$$

$$R^0_{033} = 0$$

$$R^0_{100} = 0$$

$$R^0_{101} = \frac{2 \cdot G \cdot M}{2 \sqrt{r \cdot (-2 \cdot G \cdot M + c \cdot r)}}$$

$$R^0_{102} = 0$$

$$R^0_{103} = 0$$

$$R^0_{110} = \frac{2 \cdot G \cdot M}{2 \sqrt{r \cdot (2 \cdot G \cdot M - c \cdot r)}}$$

$$R^0_{111} = 0$$

$$R^0_{112} = 0$$

$$R^0_{113} = 0$$

$$R^0_{120} = 0$$

$$R^0_{121} = 0$$

$$R^0_{122} = 0$$

$$R^0_{123} = 0$$

$$R^0_{130} = 0$$

$$R^0_{131} = 0$$

$$R^0_{132} = 0$$

$$R^0_{133} = 0$$

$$R^0_{200} = 0$$

$$R^0_{201} = 0$$

$$R^0_{202} = \frac{-G \cdot M}{2}$$

$$R^0_{203} = 0$$

$$R^0_{210} = 0$$

$$R^0_{211} = 0$$

$$R^0_{212} = 0$$

$$R^0_{213} = 0$$

$$R^0_{220} = \frac{G \cdot M}{2}$$

$$R^0_{221} = 0$$

$$R^0_{222} = 0$$

$$R^0_{223} = 0$$

$$R^0_{230} = 0$$

$$R^0_{231} = 0$$

$$R^0_{232} = 0$$

$$R^0_{233} = 0$$

$$R^0_{300} = 0$$

$$R^0_{301} = 0$$

$$R^0_{302} = 0$$

$$R^0_{303} = \frac{-G \cdot M \cdot \sin(\theta)}{2}$$

$$R_{303}^0 = \frac{\quad}{\quad}$$

$$2$$

$$c \cdot r$$

$$R_{310}^0 = 0$$

$$R_{311}^0 = 0$$

$$R_{312}^0 = 0$$

$$R_{313}^0 = 0$$

$$R_{320}^0 = 0$$

$$R_{321}^0 = 0$$

$$R_{322}^0 = 0$$

$$R_{323}^0 = 0$$

$$2$$

$$G \cdot M \cdot \sin(\theta)$$

$$R_{330}^0 = \frac{\quad}{\quad}$$

$$2$$

$$c \cdot r$$

$$R_{331}^0 = 0$$

$$R_{332}^0 = 0$$

$$R_{333}^0 = 0$$

$$R_{000}^1 = 0$$

$$2 \cdot G \cdot M \cdot \left( -2 \cdot G \cdot M + c \cdot r \right)$$

$$R_{001}^1 = \frac{\quad}{\quad}$$

$$4 \cdot 4$$

$$c \cdot r$$

$$R_{002}^1 = 0$$

$$R_{003}^1 = 0$$

$$2 \cdot G \cdot M \cdot \left( 2 \cdot G \cdot M - c \cdot r \right)$$

$$R_{010}^1 = \frac{\quad}{\quad}$$

$$4 \cdot 4$$

$$c \cdot r$$

$$R_{011}^1 = 0$$

$$R_{012}^1 = 0$$

$$R_{013}^1 = 0$$

$$R_{020}^1 = 0$$

$$R_{021}^1 = 0$$

$$R_{022}^1 = 0$$

$$R_{023}^1 = 0$$

$$R_{030}^1 = 0$$

$$R_{031}^1 = 0$$

$$R_{032}^1 = 0$$

$$R_{033}^1 = 0$$

$$R_{100}^1 = 0$$

$$R_{101}^1 = 0$$

$$R_{102}^1 = 0$$

$$R_{103}^1 = 0$$

$$R_{110}^1 = 0$$

$$R_{111}^1 = 0$$

$$R_{112}^1 = 0$$

$$R_{113}^1 = 0$$

$$R^1_{120} = 0$$

$$R^1_{121} = 0$$

$$R^1_{122} = 0$$

$$R^1_{123} = 0$$

$$R^1_{130} = 0$$

$$R^1_{131} = 0$$

$$R^1_{132} = 0$$

$$R^1_{133} = 0$$

$$R^1_{200} = 0$$

$$R^1_{201} = 0$$

$$R^1_{202} = 0$$

$$R^1_{203} = 0$$

$$R^1_{210} = 0$$

$$R^1_{211} = 0$$

$$-G \cdot M$$

$$R^1_{212} = \frac{\quad}{2}$$

$$c \cdot r$$

$$R^1_{213} = 0$$

$$R^1_{220} = 0$$

$$G \cdot M$$

$$R^1_{221} = \frac{\quad}{2}$$

$$c \cdot r$$

$$R^1_{222} = 0$$

$$R^1_{223} = 0$$

$$R^1_{230} = 0$$

$$R^1_{231} = 0$$

$$R^1_{232} = 0$$

$$R^1_{233} = 0$$

$$R^1_{300} = 0$$

$$R^1_{301} = 0$$

$$R^1_{302} = 0$$

$$R^1_{303} = 0$$

$$R^1_{310} = 0$$

$$R^1_{311} = 0$$

$$R^1_{312} = 0$$

$$2$$

$$-G \cdot M \cdot \sin(\theta)$$

$$R^1_{313} = \frac{\quad}{2}$$

$$c \cdot r$$

$$R^1_{320} = 0$$

$$R^1_{321} = 0$$

$$R^1_{322} = 0$$

$$R^1_{323} = 0$$

$$R^1_{330} = 0$$

$$2$$

$$G \cdot M \cdot \sin(\theta)$$

$$R^1_{331} = \frac{\quad}{2}$$

$$2$$

$$\begin{aligned}
 & c \cdot r \\
 R^1_{332} &= 0 \\
 R^1_{333} &= 0 \\
 R^2_{000} &= 0 \\
 R^2_{001} &= 0 \\
 & G \cdot M \cdot \left( \frac{2}{r^2} \right) \\
 R^2_{002} &= \frac{G \cdot M \cdot \left( \frac{2}{r^2} \right)}{4}
 \end{aligned}$$

$$\begin{aligned}
 & c \cdot r \\
 R^2_{003} &= 0 \\
 R^2_{010} &= 0 \\
 R^2_{011} &= 0 \\
 R^2_{012} &= 0 \\
 R^2_{013} &= 0 \\
 & G \cdot M \cdot \left( \frac{2}{r^2} \right) \\
 R^2_{020} &= \frac{G \cdot M \cdot \left( \frac{2}{r^2} \right)}{4}
 \end{aligned}$$

$$\begin{aligned}
 & c \cdot r \\
 R^2_{021} &= 0 \\
 R^2_{022} &= 0 \\
 R^2_{023} &= 0 \\
 R^2_{030} &= 0 \\
 R^2_{031} &= 0 \\
 R^2_{032} &= 0 \\
 R^2_{033} &= 0 \\
 R^2_{100} &= 0 \\
 R^2_{101} &= 0 \\
 R^2_{102} &= 0 \\
 R^2_{103} &= 0 \\
 R^2_{110} &= 0 \\
 R^2_{111} &= 0
 \end{aligned}$$

$$\begin{aligned}
 & G \cdot M \\
 R^2_{112} &= \frac{G \cdot M}{2 \cdot \left( \frac{2}{r^2} \right)} \\
 & r \cdot \left( \frac{2}{r^2} \right)
 \end{aligned}$$

$$\begin{aligned}
 R^2_{113} &= 0 \\
 R^2_{120} &= 0
 \end{aligned}$$

$$\begin{aligned}
 & G \cdot M \\
 R^2_{121} &= \frac{G \cdot M}{2 \cdot \left( \frac{2}{r^2} \right)} \\
 & r \cdot \left( \frac{2}{r^2} \right)
 \end{aligned}$$

$$\begin{aligned}
 R^2_{122} &= 0 \\
 R^2_{123} &= 0 \\
 R^2_{130} &= 0 \\
 R^2_{131} &= 0 \\
 R^2_{132} &= 0 \\
 R^2_{133} &= 0 \\
 R^2_{200} &= 0 \\
 R^2_{201} &= 0
 \end{aligned}$$

$$R^2_{202} = 0$$

$$R^2_{203} = 0$$

$$R^2_{210} = 0$$

$$R^2_{211} = 0$$

$$R^2_{212} = 0$$

$$R^2_{213} = 0$$

$$R^2_{220} = 0$$

$$R^2_{221} = 0$$

$$R^2_{222} = 0$$

$$R^2_{223} = 0$$

$$R^2_{230} = 0$$

$$R^2_{231} = 0$$

$$R^2_{232} = 0$$

$$R^2_{233} = 0$$

$$R^2_{300} = 0$$

$$R^2_{301} = 0$$

$$R^2_{302} = 0$$

$$R^2_{303} = 0$$

$$R^2_{310} = 0$$

$$R^2_{311} = 0$$

$$R^2_{312} = 0$$

$$R^2_{313} = 0$$

$$R^2_{320} = 0$$

$$R^2_{321} = 0$$

$$R^2_{322} = 0$$

$$R^2_{323} = \frac{2 \cdot G \cdot M \cdot \sin(\theta)}{c \cdot r}$$

$$R^2_{330} = 0$$

$$R^2_{331} = 0$$

$$R^2_{332} = \frac{-2 \cdot G \cdot M \cdot \sin(\theta)}{c \cdot r}$$

$$R^2_{333} = 0$$

$$R^3_{000} = 0$$

$$R^3_{001} = 0$$

$$R^3_{002} = \frac{G \cdot M \cdot \left( \frac{2}{c \cdot r} \right)}{c \cdot r}$$

$$R^3_{010} = 0$$

$$R^3_{011} = 0$$

$$R^3_{012} = 0$$

$$R^3_{013} = 0$$

$$R^3_{020} = 0$$



$$R^3_{021} = 0$$

$$R^3_{022} = 0$$

$$R^3_{023} = 0$$

$$R^3_{030} = \frac{G \cdot M \cdot \left( \frac{2}{r^2} \cdot (-2 \cdot G \cdot M + c \cdot r) \right)}{c \cdot r}$$

$$R^3_{031} = 0$$

$$R^3_{032} = 0$$

$$R^3_{033} = 0$$

$$R^3_{100} = 0$$

$$R^3_{101} = 0$$

$$R^3_{102} = 0$$

$$R^3_{103} = 0$$

$$R^3_{110} = 0$$

$$R^3_{111} = 0$$

$$R^3_{112} = 0$$

$$R^3_{113} = \frac{G \cdot M}{r \cdot \left( \frac{2}{r^2} \cdot (-2 \cdot G \cdot M + c \cdot r) \right)}$$

$$R^3_{120} = 0$$

$$R^3_{121} = 0$$

$$R^3_{122} = 0$$

$$R^3_{123} = 0$$

$$R^3_{130} = 0$$

$$R^3_{131} = \frac{G \cdot M}{r \cdot \left( \frac{2}{r^2} \cdot (2 \cdot G \cdot M - c \cdot r) \right)}$$

$$R^3_{132} = 0$$

$$R^3_{133} = 0$$

$$R^3_{200} = 0$$

$$R^3_{201} = 0$$

$$R^3_{202} = 0$$

$$R^3_{203} = 0$$

$$R^3_{210} = 0$$

$$R^3_{211} = 0$$

$$R^3_{212} = 0$$

$$R^3_{213} = 0$$

$$R^3_{220} = 0$$

$$R^3_{221} = 0$$

$$R^3_{222} = 0$$

$$R^3_{223} = \frac{-2 \cdot G \cdot M}{c \cdot r}$$

$$R^3_{230} = 0$$

$$R^3_{231} = 0$$

$$R^3_{232} = 2 \cdot G \cdot M$$

$$R^3_{232} = \frac{c \cdot r}{2}$$

$$R^3_{233} = 0$$

$$R^3_{300} = 0$$

$$R^3_{301} = 0$$

$$R^3_{302} = 0$$

$$R^3_{303} = 0$$

$$R^3_{310} = 0$$

$$R^3_{311} = 0$$

$$R^3_{312} = 0$$

$$R^3_{313} = 0$$

$$R^3_{320} = 0$$

$$R^3_{321} = 0$$

$$R^3_{322} = 0$$

$$R^3_{323} = 0$$

$$R^3_{330} = 0$$

$$R^3_{331} = 0$$

$$R^3_{332} = 0$$

$$R^3_{333} = 0$$

Ricci curvature tensor coefficients (dd)

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$$R_{00} = 0$$

$$R_{01} = 0$$

$$R_{02} = 0$$

$$R_{03} = 0$$

$$R_{10} = 0$$

$$R_{11} = 0$$

$$R_{12} = 0$$

$$R_{13} = 0$$

$$R_{20} = 0$$

$$R_{21} = 0$$

$$R_{22} = 0$$

$$R_{23} = 0$$

$$R_{30} = 0$$

$$R_{31} = 0$$

$$R_{32} = 0$$

$$R_{33} = 0$$

Schouten tensor coefficients (dd)

=====

$$P_{00} = \frac{G \cdot M \cdot \left( \frac{2}{c \cdot r} \right)}{4}$$

$$P_{01} = 0$$

$$P_{02} = 0$$

$P_{03} = 0$   
 $P_{10} = 0$   
 $P_{11} = 0$   
 $P_{12} = 0$   
 $P_{13} = 0$   
 $P_{20} = 0$   
 $P_{21} = 0$   
 $P_{22} = 0$   
 $P_{23} = 0$   
 $P_{30} = 0$   
 $P_{31} = 0$   
 $P_{32} = 0$   
 $P_{33} = 0$

Ricci curvature scalar

=====

$R = 0$

Einstein curvature tensor coefficients (dd)

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$G_{00} = 0$   
 $G_{01} = 0$   
 $G_{02} = 0$   
 $G_{03} = 0$   
 $G_{10} = 0$   
 $G_{11} = 0$   
 $G_{12} = 0$   
 $G_{13} = 0$   
 $G_{20} = 0$   
 $G_{21} = 0$   
 $G_{22} = 0$   
 $G_{23} = 0$   
 $G_{30} = 0$   
 $G_{31} = 0$   
 $G_{32} = 0$   
 $G_{33} = 0$

Stress-energy-momentum tensor coefficients (dd)

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$T_{00} = 0$   
 $T_{01} = 0$   
 $T_{02} = 0$   
 $T_{03} = 0$   
 $T_{10} = 0$   
 $T_{11} = 0$   
 $T_{12} = 0$   
 $T_{13} = 0$   
 $T_{20} = 0$

$$T_{21} = 0$$

$$T_{22} = 0$$

$$T_{23} = 0$$

$$T_{30} = 0$$

$$T_{31} = 0$$

$$T_{32} = 0$$

$$T_{33} = 0$$

#### Proper acceleration vectors

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$$\frac{d^2}{dt^2}(t) = 0$$

$$\frac{d^2}{dt^2}(r) = 0$$

$$\frac{d^2}{dt^2}(\theta) = 0$$

$$\frac{d^2}{dt^2}(\phi) = 0$$

#### Coordinate acceleration vectors

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$$\frac{d^2}{dt^2}(t) = 0$$

$$\frac{d^2}{dt^2}(r) = \frac{G \cdot M \cdot \left( \frac{2}{c^2} \cdot G \cdot M - c^2 \cdot r \right)}{c^4 \cdot r^3}$$

$$\frac{d^2}{dt^2}(\theta) = 0$$

$$\frac{d}{dt}(\phi) = 0$$

Geodesic deviation vectors  
 =====

$$\frac{d^2}{d\tau^2}(\xi_0) = 0$$

$$\frac{d^2}{d\tau^2}(\xi_1) = 0$$

$$\frac{d^2}{d\tau^2}(\xi_2) = 0$$

$$\frac{d^2}{d\tau^2}(\xi_3) = 0$$