Relativity Report 2

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(1) The background line element

$$\mathrm{d}s^2 = -\left(1-\frac{2\mu}{r}\right)\mathrm{d}t^2 + \left(1-\frac{2\mu}{r}\right)^{-1}\mathrm{d}r^2 + r^2(\mathrm{d}\theta^2 + \sin^2\theta \mathrm{d}\varphi^2) \tag{0.1}$$

implies the metric is obtained as

$$g_{\mu\nu} = \begin{pmatrix} -(1-2\mu/r) & 0 & 0 & 0 \\ 0 & (1-2\mu/r)^{-1} & 0 & 0 \\ 0 & 0 & r^2 & 0 \\ 0 & 0 & 0 & r^2\sin^2\theta \end{pmatrix}. \tag{0.2}$$

References

[1] R. M. Wald, *General Relativity*, University of Chicago Press, Chicago (1984).

[2] Klein Gordon equation in Schwarzschild spacetime (spherical harmonic mode expansion), StackExchange. (May 12, 2024)