

# Summary

$$ds^2 = -e^{2\alpha} dt^2 + e^{2\beta} dr^2 + r^2 d\Omega^2 \quad - (1)$$

$$\left. \begin{aligned} g_{00} &= -e^{2\alpha} = -(1-x), & g_{11} &= e^{2\beta} = (1-x)^{-1}, \\ g_{22} &= r^2, & g_{33} &= r^2 \sin^2 \theta. \\ g_{00}^{-1} &= -\frac{1}{1-x}, & g^{11} &= g^{11} = 1-x, \\ g^{22} &= 1/r^2, & g^{33} &= \frac{1}{r^2 \sin^2 \theta}. \end{aligned} \right\} - (2)$$

$$\partial_0 \beta = -\partial_0 \alpha, \quad \alpha = -\beta, \quad \partial_1 \alpha = \frac{1}{2r} (e^{-2\alpha} - 1) = \frac{x}{2r} - (3)$$

$$R^0_{101} = \frac{1}{r^2} (e^{-2\alpha} - 1) = \frac{1}{r^2} \frac{x}{1-x}, \quad - (4)$$

$$R^0_{202} = -r e^{-2\beta} \partial_1 \alpha = -r e^{2\alpha} \partial_1 \alpha = -\frac{1}{2} x (1-x) - (5)$$

$$R^0_{303} = -r e^{-2\beta} \partial_1 \alpha = -r e^{2\alpha} \partial_1 \alpha = \frac{1}{2} x (1-x) \sin^2 \theta - (6)$$

$$R^0_{303} = -r e^{-2\beta} \partial_1 \alpha = -r e^{2\alpha} \partial_1 \alpha = \frac{x}{2} (1-x) - (7)$$

$$R^1_{212} = r e^{-2\beta} \partial_1 \beta = -r e^{2\alpha} \partial_1 \alpha = \frac{x}{2} (1-x) \sin^2 \theta - (8)$$

$$R^1_{313} = R^1_{212} \sin^2 \theta = \frac{x}{2} (1-x) \sin^2 \theta - (9)$$

$$R^2_{323} = (1 - e^{2\alpha}) \sin^2 \theta = x \sin^2 \theta - (9)$$

## Riemann Elements

$$R^0_{101} = \frac{1}{r^2} \frac{x}{1-x}$$

$$R^0_{202} = -\frac{1}{2} x (1-x)$$

$$R^0_{303} = -\frac{1}{2} x (1-x) \sin^2 \theta$$

$$R^1_{212} = -\frac{1}{2} x (1-x)$$

$$R^1_{313} = -\frac{1}{2} x (1-x) \sin^2 \theta$$

$$R^2_{323} = x \sin^2 \theta$$

$$e^{2\alpha} = 1-x,$$

$$\partial_1 \alpha = \frac{x}{2r},$$

$$x = \frac{2MG}{rc^2}.$$