1) 93(17): Ampère Maxwell Law, Radial Component of J

The current density is given by:

$$J^1_1 = J_r = -\frac{A^{(0)}}{\mu_0}\left(R^1{}_0{}^{10} + R^1{}_2{}^{12} + R^1{}_3{}^{13}\right) \quad -(1)$$

$$J^2_2 = J_\theta = -\frac{A^{(0)}}{\mu_0}\left(R^2{}_0{}^{20} + R^2{}_1{}^{21} + R^2{}_3{}^{23}\right) \quad -(2)$$

$$J^3_3 = J_\phi = -\frac{A^{(0)}}{\mu_0}\left(R^3{}_0{}^{30} + R^3{}_1{}^{31} + R^3{}_2{}^{32}\right) \quad -(3)$$

We need:

$$R^1{}_{212} = re^{-2\beta}\partial_1\beta \quad -(4) \quad (C7.15)$$

$$R^1{}_{313} = re^{-2\beta}\partial_1\beta \sin^2\theta \quad -(5) \quad "$$

$$R^2{}_{323} = \left(1-e^{-2\beta}\right)\sin^2\theta \quad -(6) \quad "$$

So:

$$R^1{}_{212} = -\frac{x}{2} \;✓✓, \quad R^1{}_{313} = -\frac{x}{2}\sin^2\theta \;✓✓ \quad -(7)$$

$$R^2{}_{323} = \left(1-e^{2\alpha}\right)\sin^2\theta = x\sin^2\theta \quad -(8)$$

$$\boxed{\begin{aligned} &R^1{}_{212} = -\frac{x}{2}, \quad R^1{}_{313} = -\frac{x}{2}\sin^2\theta, \quad R^2{}_{323} = x\sin^2\theta, \\ &g^{00} = -\frac{1}{1-x}, \quad g^{11} = 1-x, \quad g^{22} = \frac{1}{r^2}, \quad g^{33} = \frac{1}{r^2\sin^2\theta} \end{aligned}} \quad -(9)$$

So

$$R^1{}_2{}^{12} = g^{11}g^{22}R^1{}_{212} = \frac{x}{2r^2}(x-1) \quad -(10)$$

$$R^1{}_3{}^{13} = g^{11}g^{33}R^1{}_{313} = \frac{x}{2r^2}(x-1) \quad -(11)$$

The third element of J_r is given by:

2)

$$R^{1}{}_{0}{}^{10} = g^{11} g^{00} R^{1}{}_{010} = g^{11} g^{00} g^{11} R_{1010}$$

$$= g^{11} g^{00} g^{11} g_{00} R^{0}{}_{101},$$

i.e. $$R^{1}{}_{0}{}^{10} = \left(g^{11}\right)^2 R^{0}{}_{101} \quad — (9)$$

$$= -\frac{(1-x)^2}{2r^2}\left(\frac{x}{1-x}\right)\left(\frac{x}{1-x} - 1\right)$$

$$= -\frac{x(1-x)}{2r^2}\left(\frac{x}{1-x} - 1\right)$$

$$= -\frac{x}{2r^2}\left(x - (1-x)\right) = -\frac{x}{2r^2}(2x-1)$$

$$\boxed{R^{1}{}_{0}{}^{10} = -\frac{x}{2r^2}(2x-1), \quad R^{1}{}_{2}{}^{12} = R^{1}{}_{3}{}^{13} = \frac{x(x-1)}{2r^2}} \quad — (10)$$

So: $$R^{1}{}_{0}{}^{10} + R^{1}{}_{2}{}^{12} + R^{1}{}_{3}{}^{13}$$

$$= -\frac{x(2x-1)}{2r^2} + \frac{x(x-1)}{r^2}$$

$$= \frac{1}{r^2}\left(x(x-1) - \frac{1}{2}x(2x-1)\right)$$

$$= \frac{1}{r^2}\left(x^2 - x - x^2 + \frac{x}{2}\right) = -\frac{x}{2r^2},$$

$$\boxed{J_r = \frac{A^{(0)}}{\mu_0} \cdot \frac{x}{2r^2}} \quad — (11)$$

$$x = \frac{2mG}{c^2}$$