

93(18) : Re of Component of \underline{J}

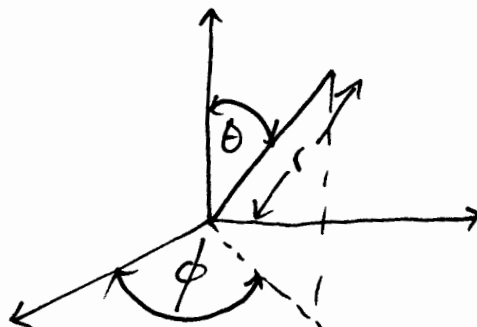
In this case:

$$\begin{aligned}
 R^3_{1^{31}} &= g^{33} g^{11} R^3_{131} = g^{33} g^{11} g^{33} R_{3131} \\
 &= (g^{33})^2 g^{11} R_{1313} = (g^{33})^2 R^1_{313} \\
 &= -\frac{x}{2r^2} \cdot \frac{1}{r^2 \sin^2 \theta} \quad - (1)
 \end{aligned}$$

$$\begin{aligned}
 R^3_{2^{32}} &= g^{33} g^{22} R^3_{232} = (g^{33})^2 g^{22} R_{3232} \\
 &= (g^{33})^2 g^{22} R_{2323} = (g^{33})^2 R^2_{323} \\
 &= \frac{x}{r^2} \cdot \frac{1}{r^2 \sin^2 \theta} \quad - (2)
 \end{aligned}$$

$$\begin{aligned}
 R^3_{0^{30}} &= g^{33} g^{00} R^3_{030} = (g^{33})^2 g^{00} R_{3030} \\
 &= (g^{33})^2 g^{00} R_{0303} = (g^{33})^2 R^0_{303} \\
 &= -\frac{x}{2r^2} \cdot \frac{1}{r^2 \sin^2 \theta} \quad - (3)
 \end{aligned}$$

$$\boxed{
 \begin{aligned}
 \underline{J} \cdot \underline{\phi} &= -\frac{A^{(0)}}{\mu_0} (R^3_{0^{30}} + R^3_{1^{31}} + R^3_{2^{32}}) \quad - (4) \\
 &= 0
 \end{aligned}
 }$$



Spherical polar
Coordinates

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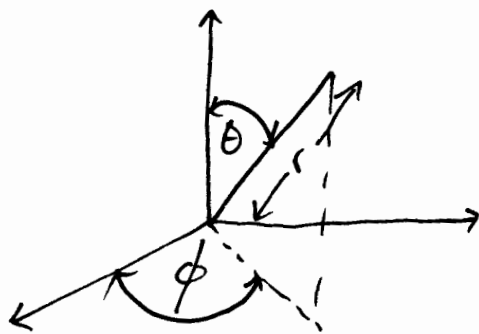
In this case:

$$\begin{aligned} R^3_{1^{31}} &= g^{33} g^{11} R^3_{131} = g^{33} g^{11} g^{33} R_{3131} \\ &= (g^{33})^2 g^{11} R_{1313} = (g^{33})^2 R^1_{313} \\ &= -\frac{x}{2r^2} \cdot \frac{1}{r^2 \sin^2 \theta} \quad - (1) \end{aligned}$$

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$$\begin{aligned} R^3_{0^{30}} &= g^{33} g^{00} R^3_{030} = (g^{33})^2 g^{00} R_{3030} \\ &= (g^{33})^2 g^{00} R_{0303} = (g^{33})^2 R^0_{303} \\ &= -\frac{x}{2r^2} \cdot \frac{1}{r^2 \sin^2 \theta} \quad - (3) \end{aligned}$$

$$\boxed{\begin{aligned} \underline{J}_\phi &= -\frac{A^{(0)}}{\mu_0} (R^3_{0^{30}} + R^3_{1^{31}} + R^3_{2^{32}}) \\ &= 0 \end{aligned}} \quad - (4)$$



Spherical polar
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