I’m surprised that there’s a vector function **A** = Awhich has no curl. Let’s see.



Function of r, φ, in r,φ plane, with zero curl would satisfy:



Function with no radial coordinate would be:



That’s surprising. Let’s check in Cartesian coordinates:



And curl is:



Does this mean that static electric charges can create such an electric field? Should take the divergence of **A**…