

KERR CHARACTERISTIC NULL VECTOR FIELD 5/20/13 N.Albers

Here is a disarmingly simple expression for the characteristic field of the Kerr. It will make a mess out of you because we are referring to several coordinate systems, really! MY DEFINITIONS HERE ARE:

r :: Cartesian radius

θ :: Cartesian polar angle

σ :: $-az/\rho$

ρ :: RE[complexified radius]

ENJOY !!! Pitfalls include taking inner products of the unit vectors, you have to use the correct θ !!! This made a mess out of me.

$$\vec{k} = (\rho^2 + a^2)^{-1} [\rho r \hat{r} + a \sigma \hat{z} - a r \sin \theta \hat{\phi}] .$$