Escalares de Kretschmann

Saturday, November 18, 2023 9:53 PM

```
]:= Rg[r_] := rg (1 - Exp[-a^3 r^3]);
    B[r_] := 1 - Rg[r]/r;
    Bs[r_] := 1 - rg/r;
```

B para dymnikova
Bs para Schwarzschild

Dymnikova

K

$$\frac{3\,e^{-2a^3r^3}\left(4+4e^{2a^3r^3}+8a^3r^3-4e^{a^3r^3}\left(2+2a^3r^3+3a^6r^6\right)+3a^6r^6\left(8+9a^6r^6\right)\right)rg^2}{r^6}$$

obteniendo componentes del escalar para aplicar el limite

```
In[52]:= R = TGetComponents["RicciScalar", {}, "Spherical"][[1]];
         R
Out[53]= 3 a^3 e^(-a^3 r^3) (4 - 3 a^3 r^3) rg

In[54]:= Limit[R, r → 0]
Out[54]= 12 a^3 rg

In[55]:= K = TGetComponents["KretschmannScalar", {}, "Spherical"][[1]];
         K
Out[56]= (3 e^(-2 a^3 r^3) (4 + 4 e^(2 a^3 r^3) + 8 a^3 r^3 - 4 e^(a^3 r^3) (2 + 2 a^3 r^3 + 3 a^6 r^6) + 3 a^6 r^6 (8 + 9 a^6 r^6)) rg^2)/r^6

In[57]:= Limit[K, r → 0]
Out[57]= 24 a^6 rg^2
```

Schwarzschild

```
TShow@TCalc["KretschmannScalar", metricaRiemann["ρσμν"].metricaRiemann["ρσμν"], "K"]
```

TMessage: Overwriting the tensor "KretschmannScalar".

KretschmannScalar: $K(t, r, \theta, \phi) = \frac{12\,rg^2}{r^6}$

```
R = TGetComponents["RicciScalar", {}, "Spherical"][[1]];
R
```

$$0$$

```
Limit[R, r → 0]
```

$$0$$

```
K = TGetComponents["KretschmannScalar", {}, "Spherical"][[1]];
K
```

$$\frac{12\,rg^2}{r^6}$$

```
Limit[K, r → 0]
```

$$\infty\,\text{Sign}[rg]^2$$