KerrNullGeoDistant

KerrNullGeoDistant[a, θ_0, α, β, *shellRadius_ : 50, radiusLimit_ : 0*]

returns a KerrNullGeoDistantFunction which stores information about the trajectory of a light-ray scattering off the black hole from infinity. The spin a, and Bardeen's impact parameters α, β are assumed to be given in units of the BH mass

KerrNullGeoDistant[*a_*, θ_0_, *α_*, *β_*, *shellRadius_:50, radiusLimit_:0,* OptionsPattern[]] takes the parameter *a*, which is the dimensionless angular momentum (a = J / M^2 in G = c = 1 units), the polar coordinate of the observer θ_0, the Bardeen coordinates α, β, the optional arguments *shellRadius* (in G=c=M=1 units) which dictates the radius of shell intersection coordinates which are used for generating distorted stellar background using the StellarBackgroundFromTemplate function, *radiusLimit*, the greatest radius at which the disk near the black hole should be visible, and an options pattern.

The following options can be given:

"Rotation"	"Counterclockwise"	Sets the direction of rotation of the black hole. The default option is "Rotation"–> "Counterclockwise". The opposite is "Rotation"–> "Clockwise".
"PhiRange"	{-Infinity, Infinity}	Sets the range of output of the azimuthal angle. The default is "PhiRange"–> {–∞, ∞}, which starts the coordinate at 0 and does not take the modulus of it after full windings. Typical options could be {–π, π} or {0, 2π}, but other option values in the format {bottomvalue, topvalue} are valid as well.

Tech Notes

KerrNullGeodesics

Related Links

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See Also

KerrNullGeo · **KerrNullGeoDistantFunction** ·

Related Guides

KerrNullGeodesics

Examples Initialization

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Needs["BlackHoleImages`"]
```

Basic Examples

More Examples ▹

Compute a geodesic in geometry given by $a = 0.6$, with the initial values $\theta = \pi/3$, $\alpha = 6$, $\beta = 7$:

In[17]:=
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geod = KerrNullGeoDistant[0.6, π / 3, 6, 7];
```

Access the constant of motion ℓ and the escape coordinates θx, ϕx:

In[18]:=
```
ℓ = geod["ConstantsOfMotion"]["ℓ"]
{θx, ϕx} = geod["EscapeCoordinates"]
```

Out[18]= $-3\sqrt{3}$

Out[19]= {2.52403, -3.96582}

Get the Boyer-Lindquist coordinates at Mino time λ=0.1:

In[20]:=
```
geod[0.1]
```

Out[20]= {4.90212, 11.3013, 0.598116, -1.16209}

More Examples

Scope

Generalizations & Extensions

Options

"Rotation"

"PhiRange"

Applications

Properties & Relations

Possible Issues

Interactive Examples

Neat Examples

Metadata

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Categorization

Keywords

Syntax Templates