Collisions of Spinning Particles in a Schwarzschild Background

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Background:
High center of mass energies are interesting (new physics)

- Black holes can in principle produce $E_{CM} \to \infty$, but one neds
- Extremely rotating black hole
- Collision at the horizon
- Angular momentum /: critical

$\Rightarrow$ Unlikely, hard to observe

Idea

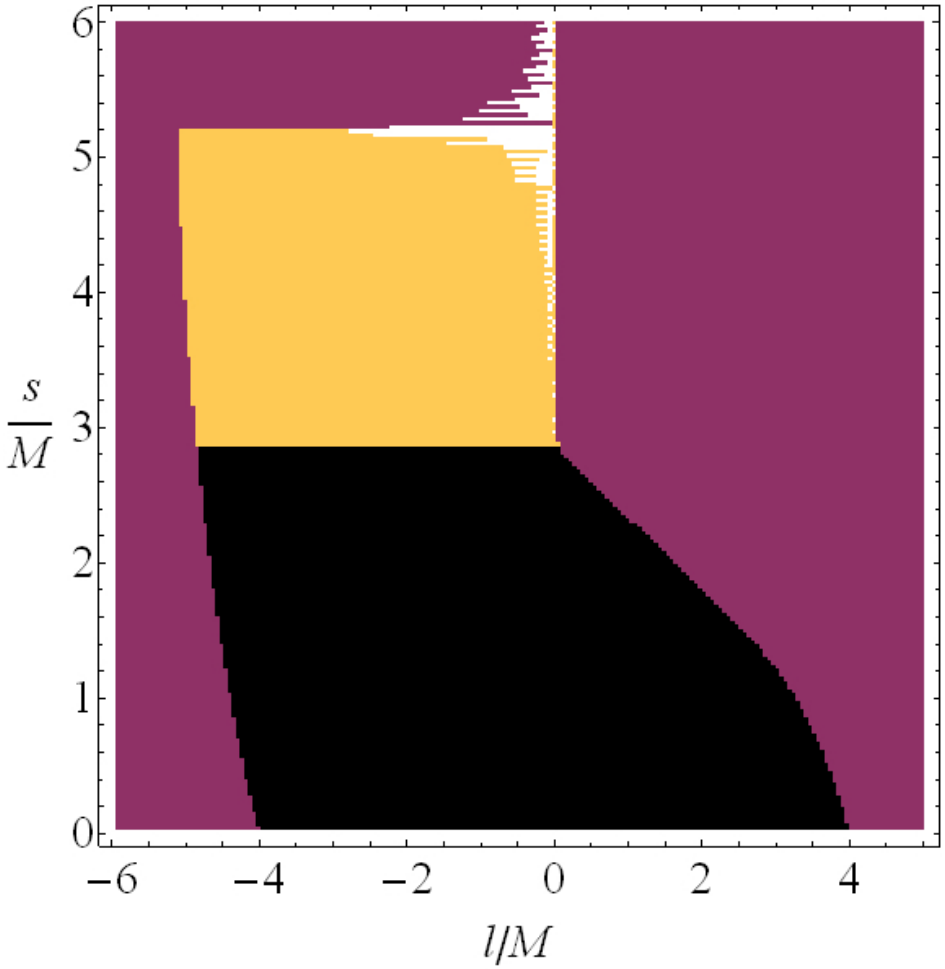
Idea:
Let the particle rotate and the black hole be spherical

- Can one produce $E_{CM} \to \infty$?
  If yes:
- Has the collision to be at the horizon?
- Has the angular momentum /: to be critical?
- Is there a notion of extremely rotating particle?

$\Rightarrow$ Solve Papapetru equations and see ...

Result-plot

Result-1:



E_{CM} divergent for yellow region

Result-summary:

- One can produce $E_{CM} \to \infty$
- Even outside the horizon
- Even for range of angular momentum
- Is there a notion of extremely rotating particle? $\Rightarrow$ Yes, kind of.

$\Rightarrow$ More interesting stuff found: see arXiv:1511.04429, or poster, or ask

Time is up, thank you!