Description

In recent work, mass accretion rate $\dot{M}$ of particles with mass m has been computed for black hole of mass M, moving with velocity v:

$$\dot{M} > 27M^2 m n_\infty \gamma.$$

Lorentz factor is $\gamma = 1/\sqrt{1 - v^2}$, and speed of light $c = 1$. Number density of particles far from black hole is denoted as n_∞.

Goal of the project is to verify formula above by Monte Carlo simulation. It could use at first stage simple „shooting" at black hole from "infinity". One might assume initial velocity to be parallel to black hole velocity. Then geodesics must be computed either numerically of analytically and classified into three categories: falling, scattered or trapped into orbit. Ratio of falling/scattered trajectories should be proportional to $\dot{M}$.