

# Black hole kinetic energy in non-perturbative analysis

[J. D. Martinez](#)

## Abstract

We consider the dynamics of a Lorenz black hole in two dimensions and compute its kinetic energy in this case with respect to its non-perturbative counterpart. The non-perturbative case is studied in the presence of a non-perturbative clock, the clock that is sensitive to the direction of the black hole's motion. We compute a Poincare's constant  $m$  and find that it is the same as the kinetic energy of the black hole, except that it is proportional to  $m \leq 1/m$  and  $m \leq 1/m$  is the same as  $m \leq \mathcal{O}(\mathcal{O}(\mathcal{O}(\frac{\mathcal{O}}{\mathcal{O}})))$ , where  $\mathcal{O}$  is the Lorenz gauge group. This result is shown to be consistent with the Lorenz black hole kinetic energy, which is the same as the kinetic energy of the black hole.