Confidential Report on Arctan Functionality

Lunar Labs BV

May 28, 2024

1 Introduction

Gravitational lensing is a phenomenon predicted by general relativity where the gravitational field of a massive object, such as a star or a black hole, bends the light passing near it. In this document, we explore the bending of light around a closed timelike curve (CTC) device, which theoretically allows for time travel.

2 Mathematical Formulation

Let x be the distance from the CTC device to the light source, and d be the total distance between the CTC device and the source. The deflection angle θ_f in the forward direction (from the source to the CTC device) is given by:

$$\theta_f = \arctan\left(\frac{2GM(d-x)}{c^2 x}\right)$$

And the deflection angle θ_b in the backward direction (from the CTC device back to the source) is given by:

$$\theta_b = \arctan\left(\frac{2GMx}{c^2(d-x)}\right)$$

Here, G is the gravitational constant, M is the mass causing the gravitational field, and c is the speed of light in a vacuum.

3 Confidentiality Statement