

# 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  $\theta_f$  in the forward direction (from the source to the CTC device) is given by:

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

And the deflection angle  $\theta_b$  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

This document contains proprietary information of Lunar Labs BV and is intended solely for the use of the recipient named above. Any unauthorized distribution, copying, or disclosure of this document is strictly prohibited.