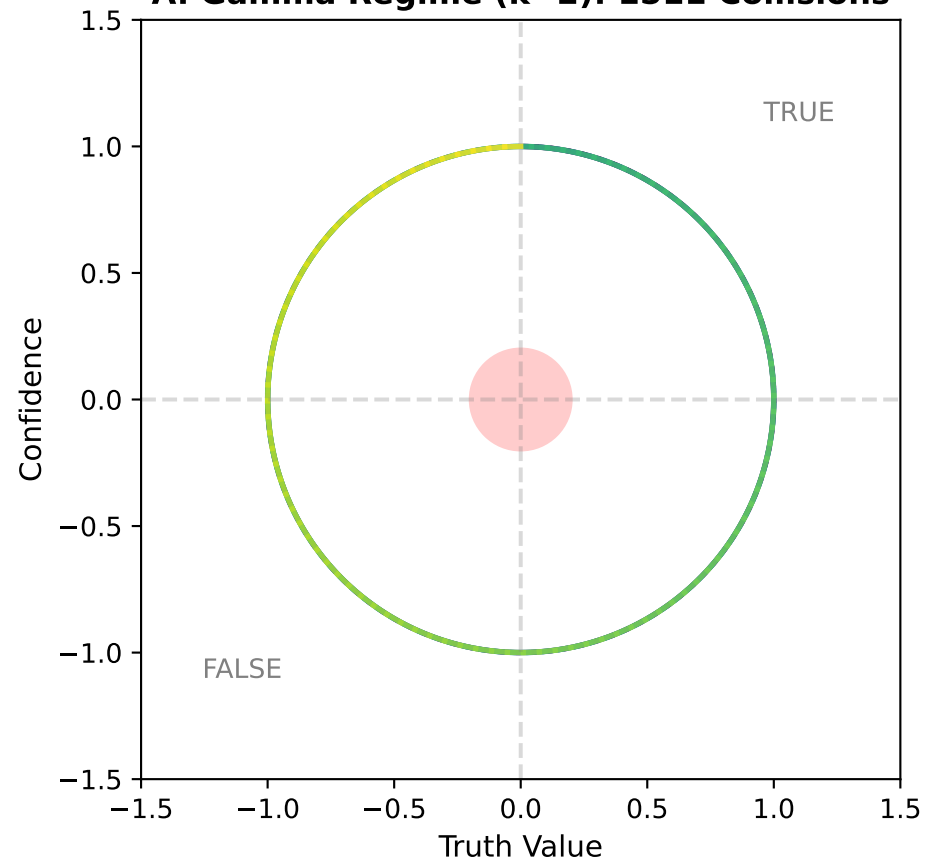
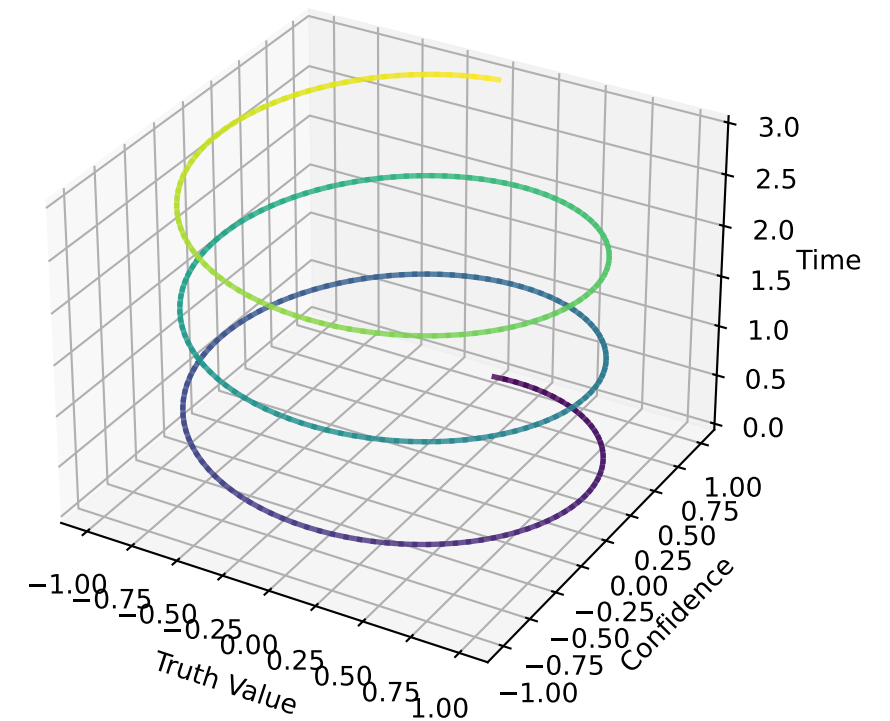


# Self-Reference Benefits from $k \geq 3$ : Geometric and Computational Illustration

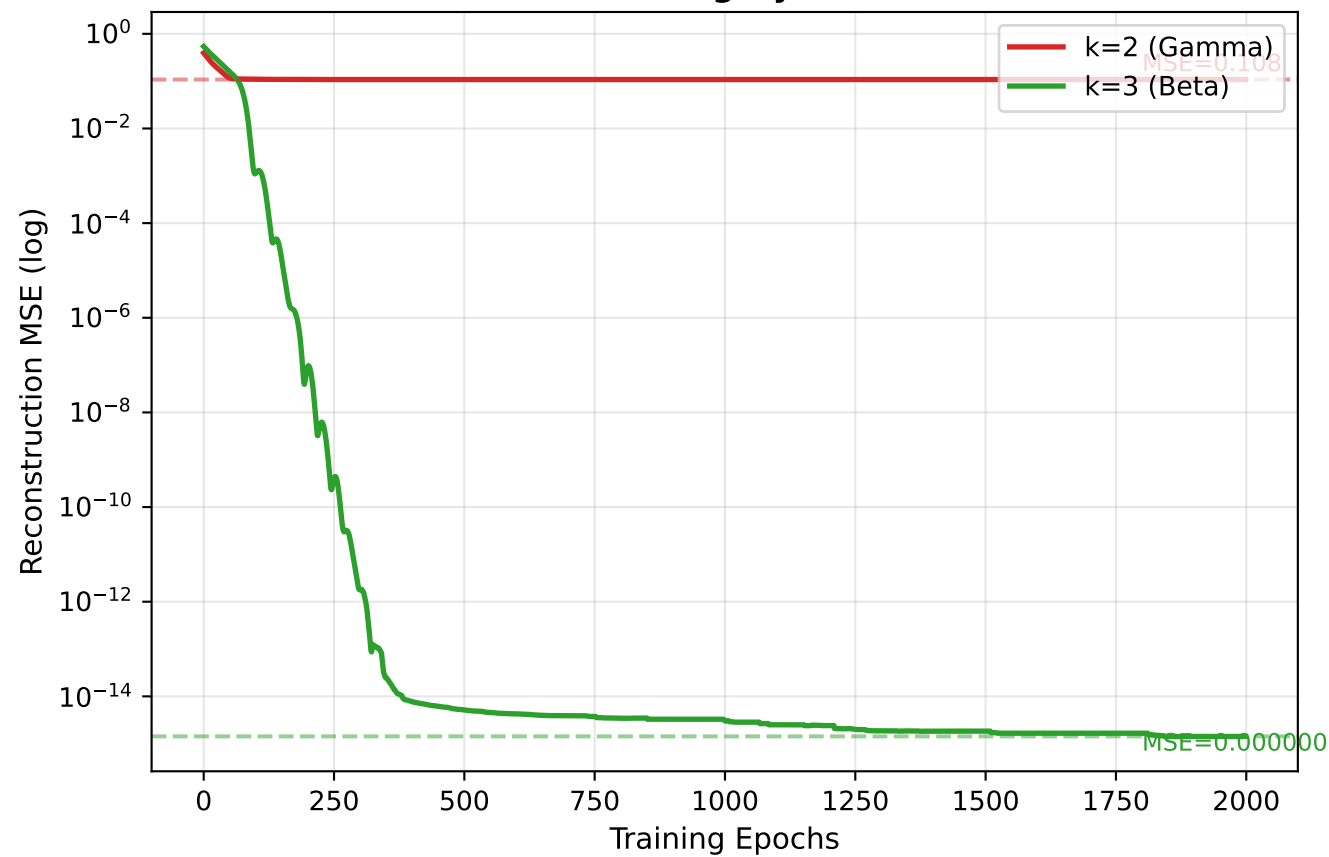
## A. Gamma Regime ( $k=2$ ): 1511 Collisions



## B. Beta Regime ( $k=3$ ): 0 Collisions



## C. Learning Dynamics



## D. Time Dimension Reconstruction

