Closed Timelike Loops in Homogeneous Rotating Λ-dust Cosmologies DAVID LINDSAY, Independent — We first describes what a "rotating" Λ-dust universe is in general relativity: basically, our universe plus a small amount of rotation. We then mention the Canonical example, the Gödel solution, which would add one rotation to our universe in about 200 billion years. Then we describe what we believe to be all known homogeneous rotating Λ-dust cosmologies. A plot of their characteristics shows that they cannot comprise all such solutions, though the literature claims (in several places) that all rotating solutions with a non-zero Λ term have been discovered. Our research has investigated these solutions for closed timelike loops (CTLs), i.e., time-machines, and concluded that exactly those with $\Lambda < 0$ possess CTLs. This observation calls into question the standard bias in GR that "too much" rotation leads to non-causal behavior; instead, it appears that a negative cosmological constant is the culprit.

David Lindsay
Independent