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LINDY'S TECHNOSIGNATURES

Abstract

The probability of detecting technosignatures - evidences of technological activity beyond Earth - increases with their longevity, or the time interval over which they manifest. Therefore, the assumed distribution of longevities significantly influences the chances of success of technosignature searches, as well as the inferred age of technosignatures following a first contact. Here, we argue that the longevity of electromagnetic technosignatures (technoemissions) is limited by the energy demanded for their operation. This implies that extraterrestrial species must overcome significant technological challenges to create long-lasting technoemissions, and those that have managed to generate technoemissions for a long time are likely to produce them for a long time in the future as well. This suggests that the longevity of technoemissions adheres to the so-called Lindy's law, whereby, at any time, their remaining life expectancy is roughly proportional to their age. We show that if Lindy's law holds, the general assumption that the first detected technosignature must be exceptionally long-lived may be challenged. We conclude by discussing the number of emitters that had to appear, over the history of the Galaxy, in order for one of them to be detectable today from Earth.