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Are there critical aspects in the time, energy and angular distributions of SN1987A?

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Supernova neutrinos are of considerable importance for ongoing research in astrophysics, nuclear and particle physics. Existing simulations of this complex event are increasingly sophisticated, but the accuracy with which they describe the emission is unknown. The only event observed so far with neutrino telescopes, SN1987A, still plays a crucial role and deserves to be studied meticulously. With this in mind, we have undertaken a refined analysis of the observations, taking into account the knowledge gained over the past decades. In this work, we consider a new parameterised model of electron antineutrino emission and test its adequacy in describing the observed distributions of energy, time and angle. The values of the model parameters derived from the data and their uncertainty intervals are presented and their significance is discussed.

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