PRODUCTION OF GRAVITATIONAL WAVES IN THE SOURCE THEORY

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ABSTRACT

We present a heuristic derivation of the vacuum persistance amplitude of source theory which gives a novel and convenient formula for radiative transition rate. This formula is used to calculate the cross section for production of gravitational waves in various processes such as rotational motion or linear acceleration.

Finally the possibility of superradiance is discussed based on the preceding formalism and results.

THE FOUR-DIMENSIONAL CLASSIFICATION OF GLOBULAR CLUSTERS AND THE GALACTIC EVOLUTION

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ABSTRACT

The four-dimensional classification of globular clusters with the parameters, Z, Y, age and HB type is presented defining two new parameters, $(B-V)_{1/2}$ and $S_{3/2}$ which are shown to be tightly correlated with Kinman's spectral types and helium abundances obtained from the R-method, respectively. The Z- and Y-abundances are derived from $(B-V)_{1/2}$ and $S_{3/2}$, respectively, and the latter parameters determine the age class of clusters with help of Dickens' HB type, which is a function of Z, Y and age. For the examined forty two globular clusters the computers with help of Dickens' HB type, which is a function of Z, Y and age. For the examined forty-two globular clusters the computed range of Z and Y are $1.5\text{x}10^{-4} \leq Z \leq 4.5 \times 10^{-2}$ and $0.23 \leq Y \leq 0.41$. The age difference between the oldest (HB type 1) and the youngest (HB type 7) clusters if roughly estimated to be 2-4x10 years. Using these four parameters the known anomalous C-M diagrams seem to be reasonably interpreted without taking into account some complicated parameters such as unusually overabundant heavy elements, mass loss and mass spread, etc. The four-dimensional scheme strongly suggests the slow successive collapses of the proto-Galaxy rather than a single fast collapse, and by this slow collapse model the inversion of chemical abundance gradient in the Galaxy can be explained. It is also shown that the clump position along the RGB near the HB level removes down to the faint magnitude as the Z(Y)-abundance increases (decreases).