METRIC PROPERTIES OF RELATIVISTIC ROTATING FRAMES WITH AXIAL SYMMETRY

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This abstract summarizes our poster contribution to the conference. We study the properties of an axially symmetric stationary gravitational field, by considering the spacetime properties of an uniformly rotating frame and the Einstein's Equivalence Principle (EEP). To undertake this, the weak field and slow-rotation limit of the kerr metric are determined, by making a first-order perturbation to the metric of a rotating frame. Also, we show a local connection between the effects of centrifugal and Coriolis forces with the effects of an axially symmetric stationary weak gravitational field, by calculating the geodesic equations of a free particle. It is observed that these geodesic, applying the (EEP), are locally equivalent to the geodesic equations of a free particle on a rotating frame.

Furthermore, some aditional properties as the Lense-Thirring effect, the Sagnac effect, among others are studied.

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TEMPORAL ALTERNATIVE CLASSIFICATION OF GAMMA RAY BURST AND SPECTRAL PROPERTIES

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After decades of the discovery of Gamma Ray Bursts (GRBs) there is not common consensus on their classification and progenitors. With no correlation with barionic matter their origin continues being a mystery. Using a large sample of the third Fermi burst catalog (2016) we will extract the emission time and canonical duration time to explore alternative classifications in the spectral properties and temporal estimator plane in the observer frame to extend the study in the burst frame. Among the 1405 bursts detected in the third catalog, 1175 are classified as long-soft bursts and 191 were simultaneously detected by Swift. Our analysis is centered only in the long-soft bursts detected by GBM Fermi detector in the energy range 50 – 300 keV. We aim to compare the results with a previous similar analysis done with Swift burst data, which suggest a bimodal distribution of long soft burst in the rest frame. This work will be done in three steps, first the analysis of burst simultaneously detected by both observatories. Second the analysis of the sample of long soft burst and then the selection of burst with redshift. We would like to explore the temporal distribution of two temporal estimators of GRBs, the canonical t_{90} and the emission time introduced by Mitrofanov (1997) in the observer frame and rest frame.

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