# CENTRAL LIMIT THEOREM OF EMPIRICAL PROCESS UNDER NEW DEPENDENT COEFFICIENT

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**Abstract**: Time series and random fields are main topics in modern statistical techniques. This is because they are essential for applications where randomness plays an important role. To describe the asymptotic behavior of certain time series or random fields, many ways of modeling the weak dependence have already been work out. One of the most popular is the notion of mixing,there exists a wide literature on limit theorems and statistics under various classical mixing conditions such as strong mixing condition($\alpha$-mixing), absolute regularity ($\beta$-mixing), or $\varphi$-mixing. However, many commonly used models for real-world phenomena do not satisfy classical mixing conditions. Moreover, a main inconvenience of mixing assumptions is the difficulty of checking them because the calculation involves the complicated manipulation of taking the supremum over two $\sigma$-algebras. In this paper, we introduce a new dependence coefficient ($\gamma$-weak dependence) under the Wasserstein metric according to asymptotic independent between finite dimensional joint distribution and its marginal distributions' product for random variables, some examples show that this weak dependence holds in many cases of interest, and our condition is much easier to compute for some financial time series models, moreover, we can give the computable rate of convergence for the dependence coefficient. We obtain central limit theorem of empirical process under $\gamma$-weak dependence following from the tightness criterion given in Theorem 2.1 of Shao and Yu(1996).