

**TITLE. On FOT Probability -- Part I: History and Future of a Proposed Paradigm Shift;  
Part II: *Purely Empirical* FOT-Probability Theory**

**ABSTRACT.** Part I: The history of a paradigm shift from stochastic probability to FOT probability proposed 33 years ago is summarized and analyzed with regard to its future. Part II: The previously mostly-ignored member of the complete hierarchical family of three nonstochastic theories of statistical spectral analysis is focused on here. The three theories apply to time series that are, in order of mathematizability, 1) approximately, 2) approximately, and 3) exactly stationary, cyclostationary, and polycyclostationary time series. These member theories are 1) purely empirical non-probabilistic, 2) purely empirical FOT-probabilistic, and 3) non-empirical (but at least non-stochastic) FOT-probabilistic theories. The newly-focused -on member 2) is said to be *purely empirical* because it excludes a) ensembles of outcomes of hypothetical experiments, b) all quantities that are not identifiable as, or cannot be calculated/computed from, recorded physical measurements or observations, and c) mathematical limits as some parameter(s) approaches infinity, such as averaging time. Finite-time time-varying FOT cumulative distributions and corresponding fundamental theorems of expectation and sine-wave extraction are described for case 2). These quantities are approximately constant, periodic, or polyperiodic and these properties theoretically become exact asymptotically as averaging time approaches infinity, in which case family member 2) becomes member 3.