

# A new central limit theorem for additive functionals of Markov chains

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The talk is about a new central limit theorem for additive functionals of stationary Markov chains with general state space. The method of proof is using a new idea involving conditioning with respect to both the past and the future of the chain. Practically, we show that any stationary and ergodic Markov chain with  $\text{var}(S_n)/n$  uniformly bounded, satisfies a central limit theorem with a random centering. We do not assume that the Markov chain is irreducible or aperiodic. However, the random centering is not needed if the Markov chain satisfies stronger forms of ergodicity. We also provide a new sufficient projective condition, which assures that  $\text{var}(S_n)/n$  is uniformly bounded and mention several open questions.