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**Nicolai T Haydn\*** ([nhaydn@usc.edu](mailto:nhaydn@usc.edu)), Department of Mathematics, University of Southern California, Los Angeles, CA 90089. *Return times statistics for Markov towers.*

We show that for Lai-Sang Young's Markov towers the return times are in the limit Poisson distributed for sets that are countably infinite unions of cylinders. We use the decay of correlations for Hölder continuous functions paired up with  $L^\infty$  functions and the Chen-Stein method to obtain the approximate Poisson distribution for the return times distribution. Naturally, the return set has to satisfy a 'non-periodicity' condition to avoid very short, periodic like, returns. (Received August 12, 2010)