1154-60-1130 **Mark Huber*** (mhuber@cmc.edu), Claremont McKenna College, 850 Columbia AV, Claremont, CA 91711. *Using particle-distribution duality to determine mixing time.*

Quantum mechanics has long had particle-wave duality, two ways of viewing the same physical process. Similarly, Markov operators have a particle-distribution duality: they can be viewed as a particle evolving randomly from state to state or as a distribution which is acted upon by the Markov operator. By combining the particle and distribution ways of viewing a Markov chain, we create a special index process that can be used to give a stopping time where the particle is exactly in the stationary distribution. The expected value of the stopping time is one measure of the mixing time of the chain. As an example, we show that the mixing time of a simple symmetric random walk with partially reflecting boundaries on a line graph with n states is exactly $3n^2$. (Received September 13, 2019)