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Applications of the Projective Dynamics method to stochastically driven systems M.A. NOVOTNY, KATJA SCHAEFER, Department of Physics and Astronomy, Mississippi State University — A dynamic system which can be interpreted as continuously evolving along one coordinate can be discretized by dividing this coordinate into non-overlapping intervals, which cover the entire domain. We further impose the (sufficient) condition that only motion between adjacent intervals are permitted. A generalization of the Projective Dynamics method [1] then ensures that correct mean first passage times to an absorbing interval can be obtained by having correct transition rates. Furthermore the theoretical framework shows that the intervals can be chosen in an arbitrarily way, while keeping the above minor condition. Thus we project the dynamic system onto a master equation with the same mean first passage time. We present applications demonstrating that this procedure is in general applicable to a wide range of problems. We illustrate the application of the Projective Dynamics method to Brownian motion of particles in one and two dimensional smooth or rough energy landscapes. We also apply the method to the folding process of small linear polymer chains (with two types of atoms) subject to Brownian motion. We compare results of the mean first passage time obtained from the Projective Dynamics method with those of direct measurements. [1]Phys. Rev. Lett. 80, 3384(1998)]

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