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We consider the class of experiments which can be characterized by a Fokker-Planck dynamics corresponding to the overdamped motion of a state point in a suitable stochastic potential. We assume that the general form of the potential is known (or can be guessed with reasonable accuracy) but that its parameters are to be determined experimentally by measurements made with a noisy instrument. This possible method for determining the potential parameters, which exploits the system's own internal stochastic motion in order to rapidly explore its available parameter space, is substantially more efficient than traditional methods involving time averages of single point measurements, and yet does not appear to have been previously considered. The method could be important, when, for example, the experiment must be completed in a limited time owing either to the expense of the experimental materials or to the temporary stationarity of the preparation, situations which are commonly encountered in experimental biochemistry and biology.

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Looking at Fokker-Planck Dynamics with a Noisy Instrument

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We consider the class of experiments which can be characterized by a Fokker-Planck dynamics corresponding to the overdamped motion of a state point in a suitable stochastic potential. We assume that the general form of the potential is known (or can be guessed with reasonable accuracy) but that its parameters are to be determined experimentally by measurements made with a noisy instrument. This possible method for determining the potential parameters, which exploits the system's own internal stochastic motion in order to rapidly explore its available parameter space, is substantially more efficient than traditional methods involving time averages of single point

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