1135-62-2794 **Alona Kryshchenko*** (alona.kryshchenko@csuci.edu), One University Dr, Camarillo, CA 93012, **Alan Schumitzky** (schumitzky@aol.com), 3220 S Vermont Ave, Los Angeles, CA 90089, **Mike van Guilder** (uphill@cox.net), 4650 Sunset Blvd, Los Angeles, CA 90027, and **Michael Neely** (mnneely@gmail.com), 4650 Sunset Blvd, Los Angeles, CA 90027. *Nonparametric estimation of a mixing distribution for a family of linear stochastic dynamical systems.*

In this paper we develop a nonparametric maximum likelihood estimate of the mixing distribution of the parameters of a linear stochastic dynamical system. This includes, for example, pharmacokinetic population models with process and measurement noise that are linear in the state vector, input vector and the process and measurement noise vectors. Most research in mixing distributions only considers measurement noise. The advantages of the models with process noise are that, in addition to the measurements errors, the uncertainties in the model itself are taken into the account. For example, for deterministic pharmacokinetic models, errors in dose amounts, administration times, and timing of blood samples are typically not included. For linear stochastic models, we use linear Kalman-Bucy filtering to calculate the likelihood of the observations and then employ a nonparametric adaptive grid algorithm to find the nonparametric maximum likelihood estimate of the mixing distribution. We then use the directional derivatives of the estimated mixing distribution to show that the result found attains a global maximum. (Received September 26, 2017)