1041-14-42 **Elizabeth S. Allman** (e.allman@uaf.edu), PO Box 756660, Department of Mathematics and Statistics, University of Alaska Fairbanks, Fairbanks, AK 99775, **Catherine Matias** (catherine.matias@genopole.cnrs.fr), CNRS UMR 8071, Laboratorie Statistique et Genome, 523, Place des Terrrasses de l'Agora, 91 000 Evry, France, and **John A. Rhodes*** (j.rhodes@uaf.edu), PO Box 756660, Department of Mathematics and Statistics, University of Alaska Fairbanks, Fairbanks, AK 99775. *Hidden variables in statistical models and identifiability.*

Many types of statistical models include unobserved variables upon which the observed ones depend. Well-known examples include latent class models and hidden Markov models. It is generally difficult to understand the extent to which the parameters of such models are identifiable, though identifiability is a prerequisite for the consistency of statistical inference. Identifiability often fails for special choices of parameters, but it may hold generically, as the parameterization map is polynomial.

Focusing on a particular random graph model with many hidden variables (motivated by biological networks), we show how such a model can be algebraically mapped into a simpler model, with a single hidden variable and a conditional independence structure, which clarifies some of its algebraic structure. This leads to a proof of identifiability of the original model, for generic parameter choices. This approach can be applied to other models, such as HMMs, to easily recover known results. Additional work leads to new results on certain semi-parametric models. (Received July 23, 2008)