Bayesian Analysis of RR Lyrae Distances and Kinematics

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Abstract
We are using a hierarchical Bayes model to analyze the distances, luminosities, and
kinematics of RR Lyrae stars. Our model relates these characteristics to the raw
data of proper motions, radial velocities, apparent luminosities and metallicities of
each star. A combination of Gibbs and Metropolis-Hastings sampling, using latent
variables for the actual velocity and luminosity of each star, is used to draw a
sample from the full posterior distribution of these variables, with consideration to
admissibility and the properness of the hierarchical model[1], and draw inferences on
the quantities of interest in the usual way. We have applied our model to the large
HIPPARCOS database, and we have attempted to include metallicity and period
in our model, which has not been done previously.

References:

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