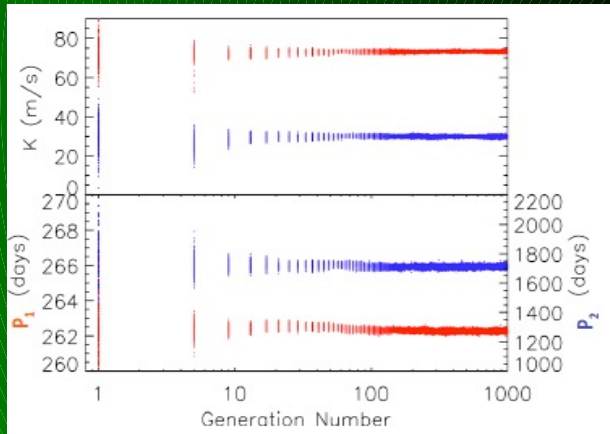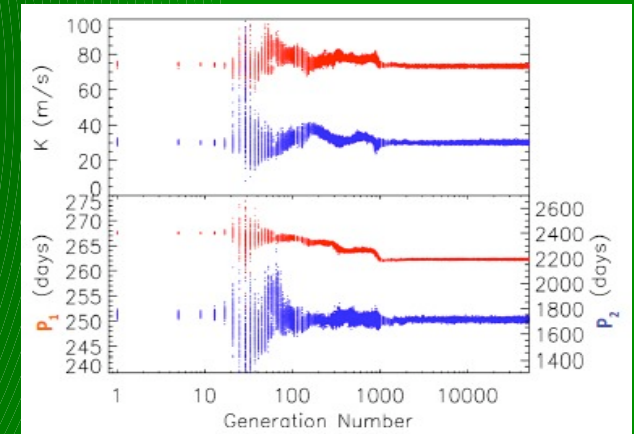Benjamin E. Nelson
University of Florida

DEMCMC Algorithm for Analyzing Multiple Planet Systems

Performs Bayesian parameter estimation of orbital elements of multi-planet systems

Testing stages: How far can we go until the algorithm breaks?

1. Generate a sample distribution of orbital elements with standard MCMC

2. Worsen our sample by scattering (left plot) and shifting (right plot) it

3. Attempt to recover a converged distribution

Plots utilize RV data from HD 12661

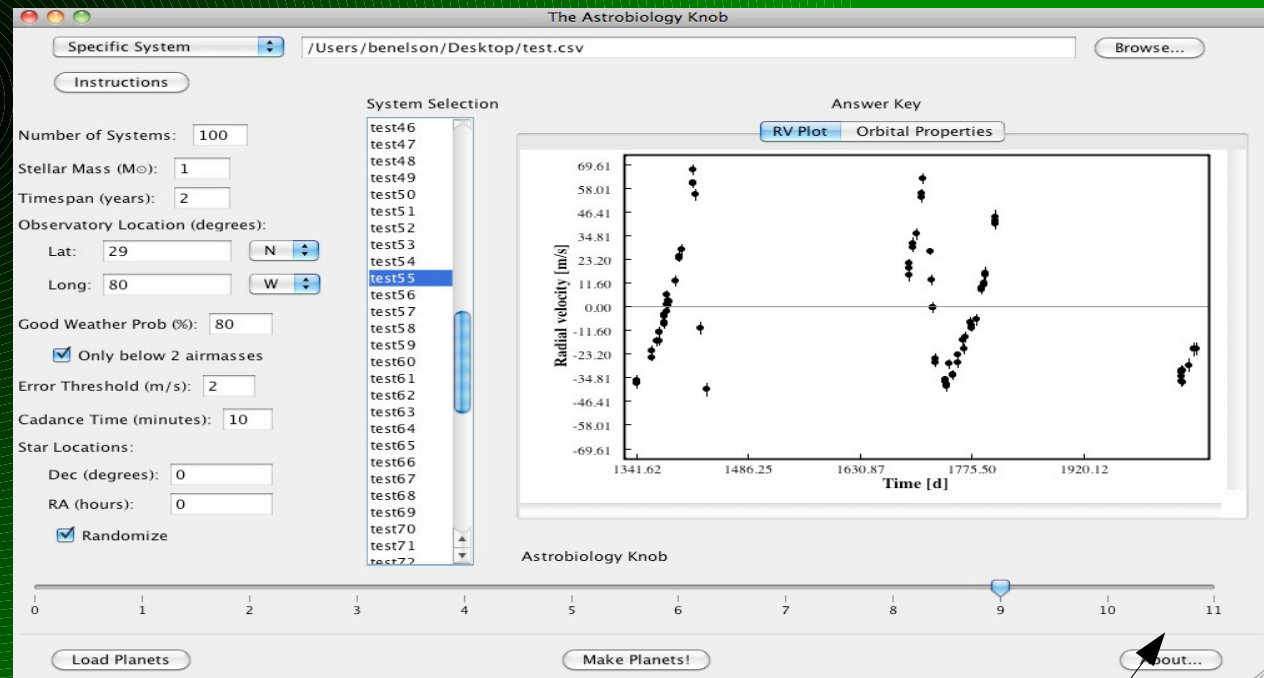Benjamin E. Nelson
University of Florida

The Astrobiology Knob

-- generates synthetic RV datasets from input distribution the user chooses

-- an optimism parameter for the possible presence of terrestrial planets

-- integrate with simple Keplerian or interacting N-body model (Runge Kutta)

-- many free parameters to manipulate (stellar mass, Doppler precision, observatory location, dataset timespan, etc.)

-- *Community feedback welcome!*

This goes to eleven

COMING 2010   http://astro.ufl.edu/~benelson/ABK.html