

P63a **Solving For The Orbital Elements Of Binary Systems Using Markov Chain Monte Carlo Simulations:2**

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Through the search for extrasolar planets, surveys are finding many planets exist in systems with multiple stars. The existence of a companion star to a planet hosting primary further complicates the evolution of the planet's orbit. In order to investigate the possible evolution mechanisms, the orbits of the stellar companions need to be accurately determined first. The commonly used radial velocity technique is only capable of detecting companions at separations under about 20AU. The orbits of these systems are normally determined with a least-squares reduction of the well known radial velocity equations, with an accuracy determined by how well the radial velocity curve is known. Now with the advancement of high-contrast instruments, such as HiCIAO on the Subaru telescope, direct imaging out to about 1000AU is possible. Multiple works by Liu et al. over the past 5 years has shown that Markov Chain Monte Carlo (MCMC) simulations can produce more constrained orbital parameter predictions than the methods of the past. We are in the process of developing a similar MCMC simulator that utilizes both of these observing methods to provide three dimensions of data to compare the models to. This new 3D simulator should be able to more accurately constrain the orbital parameters of binary systems than more simple 2D or 1D versions. Once complete, we hope this simulator may be used to help understand the effects on planetary orbit evolution in multiple star systems.