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Formation of Misaligned Hot Jupiters in Stellar Binaries

Motivated by observed hot Jupiter systems with high stellar spin-orbit misalignments, we examine the dynamics of the stellar spin axis in planetary systems where the host star has a distant (100 - 1000 AU) inclined stellar companion. In this scenario, planets can undergo Kozai-Lidov oscillations and migrate inward, while the stellar spin axis is torqued by the planet, and evolves in a complex, and often chaotic manner. Understanding the spin-orbit dynamics is helpful for understanding the formation histories of hot Jupiters, and could help differentiate between various proposed migration mechanisms. We describe the complex dynamics that the stellar spin axis undergoes, and show that the final distribution of spin-orbit misalignment angles depends strongly on both the stellar spin properties and planet mass.