

Effects of Stellar Flybys on Exocomets in the Beta Pictoris System

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Abstract

Beta Pictoris (BP) is a planetary system composed of an A-type star, two planets, and two debris disks. The short-term variability and the presence of absorption lines in the star indicate the existence of cometary material falling into the star. In this work, we present an ongoing investigation into the cause of the exocometary activity in the BP system as possible disturbances triggered by stellar flybys. These passing stars can perturb objects in the BP cloud of comets (BP's Oort cloud), altering their periastron distances and potentially injecting them into the inner stellar system, thereby inducing exocomet showers. We used precise astrometry data from the Gaia mission, supplemented by radial velocity data from other surveys, to reconstruct the stellar encounter history of the BP system by tracing back the orbits of nearby stars. We will present our preliminary results on the effect of stellar encounters on the BP's Oort cloud and its correlation with comet showers in the inner parts of the system. In addition, we will explore the exchange of comets between the Oort clouds of nearby stars and the BP system, as well as its consequences on the formation of interstellar comets using N-body simulations.

My poster in zenodo.org can be found here