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TITLE: Searching for Binaries in Proto-Planetary Nebulae: Is There Evidence from Long-Period Photometric Variations?
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ABSTRACT:
Photometric and radial velocity monitoring of the central stars of planetary nebulae have revealed many cases of binary companions. Evidence has accumulated that these companions are responsible for the shaping of the surrounding nebula, which is often complex and frequently bipolar or multipolar. High-resolution imaging of proto- (or pre-) planetary nebulae (PPNe) have revealed similar bipolar and multipolar shapes. However, limited radial velocity studies have not revealed the prevalence of binaries. We have carried out long-term (two decades) photometric monitoring of many PPNe, and complemented these with publicly-available photometric sky survey (ASAS-3 and ASAS-SN) data. We will discuss the results of these studies and what they contribute to the evidence for binarity of PPNe.