

DOUBLE WHITE DWARF SEPARATION DISTRIBUTION:
ASTROMETRIC EVIDENCE FROM GAIA FOR A GAP AT 1 AU

Valeriya Korol¹, Vasily Belokurov^{2,3} and Silvia Toonen^{1,4}

¹Institute for Gravitational Wave Astronomy & School of Physics and Astronomy, University of Birmingham, Birmingham, B15 2TT, UK

²Institute of Astronomy, Madingley Rd, Cambridge, CB3 0HA

³Center for Computational Astrophysics, Flatiron Institute, 162 5th Avenue, New York, NY 10010, USA

⁴Anton Pannekoek Institute for Astronomy, University of Amsterdam, 1090 GE Amsterdam, The Netherlands

Characterising the Galactic DWD population has proven to be technically challenging. Even with a sample now amounting to around 150 binaries, our knowledge of the physical characteristics of the DWD population remains rudimentary. Gaia offers an opportunity to identify unresolved DWD systems in bulk, significantly boosting our statistics. This is possible because the trajectory of the centre of light of an unresolved binary is different from that of its centre of mass. Binary-induced stellar centroid wobbling can therefore be detected as an excess in the goodness-of-fit of the single-star astrometric model, and the wobble amplitude can be related to the separation. In this way we can access orbital separations between approximately 0.01 and 2 au, where theoretical models predict a gap in the DWD separation distribution caused by the common envelope phase(s) prior to DWD formation. In this talk I will discuss the formation of this gap from a theoretical perspective and will discuss the comparison between the models and Gaia data.