Simplified Analytical Simulation of Mass Transfer in Double White Dwarf Systems

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Introduction

- Double white dwarf contact binary
- Source of gravitational waves
- Supernovae give standard luminosity for determining distances
- Current 3-D hydrodynamic models: slow, resource-intensive

NASA/Dana Berry, Sky Works Digital.
Goal

- Accurate simulation to run more efficiently than current complicated models
- Simplifying assumptions to run set of differential equations
- Match to previously published work\textsuperscript{1,2}

Figure 4: ESO/L. Caçada
Stable Case, $q=0.4$
Behavior for Stable Case

Red = binary separation
Black = Mass transfer rate
Green Dashed = donor angular momentum
Blue dashed = accretor angular momentum
Unstable Case, $q=1.3$
Behavior for Merging Case

Red = binary separation
Black = Mass transfer rate
Green Dashed = donor angular momentum
Blue dashed = accretor angular momentum
References and Acknowledgments

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