

IMPROVING THE PHYSICS OF MIXING DURING PHASE SEPARATION IN CRYSTALLIZING WHITE DWARF STARS

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Crystallization has important consequences for the evolution and pulsation of white dwarf stars. Similarly, the associated process of phase separation—the partial separation of carbon and oxygen during core crystallization—also affects white dwarf cooling and pulsation since it changes the amount of gravitational energy released as well as the extent of the crystallized core. We propose a new prescription for fluid mixing during phase separation that we claim is more physical. This prescription has a non-negligible effect on the gravitational energy released and a strong effect on the properties of g-mode oscillations in these stars. In agreement with recent results, we find that any magnetic fields generated during mixing should be undetectable.