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Abstract for an Invited Paper for the SES09 Meeting of the American Physical Society

The Evolutionary History of the R Coronae Borealis Stars GEOFFREY CLAYTON, Dept. of Physics & Astronomy, Louisiana State University

The R Coronae Borealis (RCB) stars are rare hydrogen-deficient carbon-rich supergiants, all apparently single stars which are consistent with being post-AGB stars. RCB stars undergo massive declines of up to 8 mag due to the formation of carbon dust at irregular intervals. The mechanism of dust formation around RCB stars is not well understood but the dust is thought to form in or near the atmosphere of the stars. Their rarity may stem from the fact that they are in an extremely rapid phase of the evolution or in an evolutionary phase that most stars do not undergo. Several evolutionary scenarios have been suggested to account for the RCB stars including, a merger of two white dwarfs (WDs), or a final helium shell flash in a PN central star. The large overabundance of 180 found in most of the RCB stars favors the WD merger scenario while the presence of Li in the atmospheres of four of the RCB stars are produced by WD mergers, which may be the low-mass counterparts of the more massive mergers thought to produce type Ia supernovae. I will present recent visible and IR observations of various RCB stars obtained with HST, Spitzer and ground-based telescopes.