

DESI ESTABLISHES DAQ WHITE DWARFS AS A DISTINCT SPECTRAL CLASS CONSISTENT WITH A  
WHITE DWARF MERGER ORIGIN.

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The *Gaia* astrometry has been revolutionary for white dwarf science, identifying several 100,000 white dwarf candidates. A structure early recognised in the *Gaia* Hertzsprung-Russell diagram is a distinct branch of very massive white dwarfs, and their nature and origin is still under discussion. A possible merger origin for (at least some of them) is supported by the discovery of a massive DAQ white dwarf with an extremely thin H/He envelope (Hollands et al. 2020). We present the analysis of 17 DAQ identified by the DESI survey, and demonstrate that all of them are massive white dwarfs clustering on the “Q-branch” – consistent with being remnants of double-degenerate mergers. The one exception is a DA+DQ double-degenerate, which, as expected, is located in the HRD above the white dwarf cooling track. We conclude that there is growing evidence that the “Q-branch” is the result of white dwarf mergers, though, the diverse spectroscopic appearance along this sequence is still puzzling.