High Spatial Resolution Infrared Observations of Dusty Disks Around DAZ White Dwarfs

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One of the more spectacular results coming out of the Spitzer Space Telescope has been the discovery of debris disks around several nearby white dwarfs. The two leading candidates for the origin of these dusty disks are mergers between white dwarfs, and these disks being the remnants of a pre-existing planetary system. Both scenarios have clearly different predictions for the spatial extent of the disk: in the planetary remnant scenario, the disk is expected to be very compact and relatively low-mass, whereas in the white dwarf merger scenario the disks are expected to be massive and may extend to tens of AU or more. To test and distinguish between these two scenarios I have used NACO at the VLT to obtain adaptive-optics assisted imaging in the L'-band (3.5 μm) of a sample of nearby DAZ white dwarfs around which dusty disks have been detected with Spitzer, provinding the most stringent constraints to date on the sizes of these disks. Both disk sizes and spectral energy distributions can be fitted well with simple models for a compact optically thick disk which is passively heated by the central star. For the majority of the stars in our sample, these results are not compatible with the white dwarf merger scenario and thus clearly favour the planetary remnant hypothesis for the origin of the dusty disks seen around DAZ white dwarfs.