



Figure 1: Left: Example spectra of the Ca II 8600 Å triplet at SDSS J0845+2257. Right: Equivalent width of the triplet in all available spectra. The colours match the spectra in the left panel. The line strength has clearly decreased over the past several years.

Target	Ra	Dec
SDSS J0845+2257	08 45 39.18	+22 57 28.25

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Instrument LRS2-R

Time Requested: 1 or more runs of 2100s each (including setup)

Disappearing Emission from a White Dwarf Debris Disc

SDSS J0845+2257 was one of the first white dwarfs found to exhibit emission from gas in an orbiting debris disc (Gänsicke et al., 2008). The variability of emission from such discs, in particular at the Ca II 8600 Å triplet, is an important tracer of dynamical activity in remnant planetary systems, most notably leading to the detection of a planetesimal embedded in the disc of the prototype object (Manser et al., 2019). Initial monitoring of the disc at SDSS J0845+2257 showed a drop then a plateau in emission strength (Wilson et al., 2015), but regular follow-up observations since then show that the emission strength has continued to decrease (Figure 1). This steady decrease stands in contrast to the rapid appearance and disappearance of emission at SDSS J1617+1620 (Wilson et al., 2014) and WD J2100+2122 (Dennihiy et al., 2020), and may demonstrate new behavior such as the slow end of a tidal disruption event generating gas.

We request to obtain a spectrum with LRS2 in the current trimester to measure the strength of the emission lines and ascertain whether or not it has continued the trend seen in Figure 1. Consulting the exposure time calculator, we find that 2x600s exposures will provide $S/N \approx 50$ in bright time, ideal for our requirements. We add the default 900s setup time, for a total request of 2100s. The information in red from the HET visibility tool is: “With the above constraints you should expect to get no more than 28 visits in this period.” This observation will continue our long term monitoring of the system and test the suitability of LRS2 for observing white dwarf gas discs in general. One visit is perfectly adequate to achieve the primary science goal, however if there is more unallocated time remaining then we would welcome further observations to search for shorter time scale variation.

References

- Gänsicke, B. T., Koester, D., Marsh, T. R., et al. 2008, *MNRAS*, 391, L103.
Manser, C. J., Gänsicke, B. T., Eggl, S., et al. 2019, *Science*, 364, 66.
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