Rotation periods and surface magnetic field structures of young weak-field magnetic white dwarfs

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Magnetic fields have been detected and studied in white dwarfs (WDs) for more than 50 years, but these fields have been modelled in detail for fewer than a dozen WDs. In order to understand the nature one of these fields, we must obtain detailed information about the structure of the magnetic field over the surface of the host star. To obtain this information, it is necessary to observe the field from multiple directions as the WD rotates, and to model the variations observed in both intensity and (at least circular) polarisation in spectral lines. We have obtained suitable spectropolarimetric data for four young (cooling ages 50 – 600 Myr) magnetic WDs which have fields of the order of hundreds of kG, determined their rotation periods (between 0.059 to 4.7 d), and carried out magnetic modelling. We describe the results of this work, and discuss the implications.