

Session 5

(Invited) Magnetism in isolated white dwarfs

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The presence of a strong magnetic field is a feature common to a significant fraction of degenerate stars, and several theories have been proposed to explain it. We will review literature data, and explain how observational biases have hidden the correlations between the incidence of magnetic field and other stellar parameters. We will present the results of a volume-limited spectropolarimetric survey of white dwarfs, which strongly support the idea that at least two different mechanisms are responsible for the presence of a surface magnetic field. In high-mass white dwarfs, which are probably the results of mergers, magnetic fields are extremely common and very strong, and appear immediately in the cooling phase. These fields may have been generated by a dynamo active during the merging. The origin of magnetic fields in white dwarfs that are result of single star evolution is totally different. Lower mass white dwarfs are rarely detectably magnetic at birth, but fields appear very slowly in about a quarter of them. What we may see is an internal field produced in an earlier evolutionary stage that gradually relaxes to the surface from the interior, eventually amplified by a dynamo generated during the crystallisation of the stellar core.