Magnetic White Dwarfs rich in Hydrogen

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The way to understand nature and its laws is through the study of matter under the most diverse conditions. In this context, white dwarfs prove to be an excellent research laboratory, as they may have temperatures, pressures, and magnetic fields that are unattainable on Earth. To better understand how these three physical parameters interact with each other and with other stellar features, we determined the magnetic field strength for 808 hydrogen-rich white dwarfs. The spectra observed with the Sloan Digital Sky Survey were adjusted using atmospheric models that consider the Zeeman effect due to the magnetic field at each point in the stellar disk. In addition, we determined the period of photometric variability for 380 of these white dwarfs observed with the Transiting Exoplanet Survey Satellite and looked for correlations with the other quantities. We found that the white dwarfs with higher magnetic fields tend to have higher masses, lower temperatures, and a crystallization process that has already begun. This reinforces the hypothesis that the field is being generated and/or amplified already in the cooling process of the white dwarf. Our work constitutes the most extended determination of magnetic fields and variation period of white dwarfs to the present day.