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**Electronic structure of Si vacancy centers in SiC** ONEY SOYKAL, PRATIBHA DEV, SOPHIA ECONOMOU, Naval Research Laboratory (NRL) — The spin state of silicon vacancies in SiC is a promising candidate for applications in solid state quantum information technologies due to its long coherence time at room temperature, its technological availability and wide range of polytypism. Until recently, the electronic structure of this vacancy was not well understood. We have developed a group theoretical model that correctly predicts the spin 3/2 structure seen in recent experiments for the 4H-SiC defect. We have included several different mechanisms involved in the mixing of its spin states, such as crystal field splitting, spin-orbit coupling, spin-spin coupling, strain and Jahn-Teller interactions. We have also carried out DFT calculations that support and complement our analytical results.

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