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Observation of a three-site defect in SI 4H-SiC N.Y. GARCES, W.E. CARLOS, E.R. GLASER, Naval Research Laboratory, Washington, DC 20375, M.A. FANTON, Electro-Optics Center, Freeport, PA 16229 — High temperature anneals were used to study the evolution of native defects in semi-insulating 4H-SiC grown by PVT or HTCVD methods. The samples were annealed in an argon atmosphere for 30 min at temperatures from 1400°C to 2100°C. Using electron paramagnetic resonance (EPR), we observe a defect that is tentatively identified as V_C-C_{Si}-V_C. This spin S=1 defect is characterized by $g_{||}$=2.0029; $g_{\perp}$=2.0038, a fine structure splitting D∼96G, and several hyperfine interactions with the low abundant Si (A∼5.5G) and C (A∼30G) neighboring nuclei. This center is diamagnetic in the ground state but can be excited into a paramagnetic triplet state by sub-bandgap light. The EPR intensity of this center increases significantly with annealing. This defect could result during annealing by the movement of an adjoining C atom onto the V_{Si} site of the divacancy (V_C–V_{Si}) whose intensity decreases. This may be the simplest of a family of more complex defects that play a role in the SI character. A search for optical signatures associated with this defect from 0.7-3.2 eV PL studies will also be discussed.

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