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Electron Spin Coherence in Silicon Carbide SCOTT LELAND CROSSEN, Brigham Young University — Spin is an important quantum mechanical effect intrinsic in electrons which contributes to the particle's overall qualitative behavior. When contained in a magnetic field, electrons have energy levels determined by the alignment of their spins. Moreover, if the spins are aligned perpendicular to the magnetic field they start to precess and become de-coherent over time. In our experiment, laser pulses align the spins in the up direction, and then a series of focused microwave pulses rotate the spins and allow their coherence to be studied through a technique known as "spin-echo". In our group, we seek to better understand what factors contribute to an electron's spin coherence over time. For this conference, I will be presenting on electron spin coherence times found in crystal lattice defects of electron-irradiated silicon carbide. Specifically, I will focus on the experimental set-up and procedure that we use for optically analyzing the spin-states of electrons in SiC. I will also focus on the effects of irradiation (proton vs electron) in overall coherence times in the sample.

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