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**Location and Magnetic Hyperfine Properties of $Mn^{2+}$ in Silicon.**
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Crystalline Silicon doped with the transition metal ion $Mn^{+2}$ is ferromagnetic at room temperature and thus potentially a useful material for spintronic applications. In attempting to understand from first principles the location of $Mn^{+2}$ and the electronic structure of the ferromagnetic system we have started work first on the dilute system. We have used the Hartree-Fock cluster procedure to determine the binding energies of the three likely locations for $Mn^{2+}$, substitutional (S), tetrahedral interstitial ($T_i$) and hexagonal interstitial ($H_i$) locations allowing for relaxation of the silicon neighbors. Our calculations show that the $H_i$ location is unstable and the S and $T_i$ are stable. Our nuclear magnetic hyperfine interactions results for $^{55}$Mn nucleus and $^{29}$Si neighbor will be presented and compared with electron spin resonance [1] experimental data.
[1] H.H. Wood bury and G. W. Ludwig Phys. Rev. 117,102(1960)

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